

A Review on Medicative Utilization of Nigella Sativa and Pharmacological Activity

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Abstract: It is recommended by the World health organization (WHO) that most of the world's population depends on herbal medicine for their health care. *Nigella sativa* is commonly known as a Black seed, Black cumin or Kalongii.e. An annual herb possessing a wide range of medicinal uses a part from its commercial significance as a spice yielding plant. *Nigella sativa* belongs to Family Ranunculaceae. It is very popular in various traditional systems of medicine like Unani, Ayurveda and Siddha. Seeds and oil have a long history of folklore usage in various systems of medicines and food. The seeds of *N. sativa* have been widely used in the treatment of different diseases and ailments. In Islamic literature, it is considered as one of the greatest forms of healing medicine. It has been recommended for using on regular basis in Tibb-e-Nabwi (Prophetic Medicine). *Nigella sativa* and its constitutions including some isolated compounds are the potential sources of remedies of varieties of ailments such as antioxidant, anti-inflammatory, antibacterial, antifungal, antiparasitic and antiprotozoal, antiviral, cytotoxic, anticancer, neuro-, gastro-, cardio-, Hepato - and nephroprotective activities. In addition, the *N. sativa* implies beneficiary effects on reproductive, pulmonary and immune systems along with diabetes mellitus (DM), fertility, breast cancer, dermatological complications, dehydration, dyspepsia, osmotic balance and so on. Among the other isolated chemical moieties, thymoquinone (TQ) is a good target for its potential antimicrobial, antimicrobial, anti-inflammatory, chemopreventive, antitumor and other activities. *N. sativa* has got the place among the top ranked evidence based herbal medicines.

Keywords: Nigella sativa, Tibb-e-Nabwi, herbal medicine, antibacterial, anti-inflammatory

I. INTRODUCTION

In the United States, the preferred standardized common name for *N. sativa* is simply “Nigella” according to the second edition of the American Herbal Products Association’s Herbs of Commerce [1]. *Nigella Sativa* is also known as black seed or black cumin, which belongs to the Ranunculaceae family, is an annual herb plant with many pharmacological properties [2]. The use of *N. sativa* (NS) seeds and oil in traditional remedies goes back more than 2000 years, and the herb is described as ‘The Melanthion’ by Hippocrates and Discords [3]. It is an annual flowering plant, commonly grown in Middle Eastern and western Asian countries including Syria, Lebanon, Pakistan, India and Afghanistan. In India, it is locally named as 'Kalonji' which has been utilized from ancient times.

1.1 Botanical Description of Nigella Sativa

It grows 20-30 cm tall. With finely divided, linear leaves. The flowers are usually pale blue and white, with 5-10 petals. The fruit is a large inflated capsule composed of 3-7 united follicles, each containing numerous seeds [4,5]. The transverse sections of seed have single layered epidermis which is 2-4 layers the parenchymatous cells, and covered by externally papillose cuticle [6].

1.2 Scientific Classification

- Kingdom: Plantae
- Division: Magnoliophyta
- Order: Ranunculales

- Family: Ranunculaceae
- Genus: Nigella
- Species: sativa [7]

N. sativa plant is one of the most extensively studied, both phytochemicals and pharmacologically. The extracts of N. sativa seeds have been used by patients to suppress cough [8]. Disintegrate renal calculi [9]. Retard the carcinogenic process [10]. Treat abdominal pain, diarrhea, flatulence and polio [11]. Anti-inflammatory and antioxidant [12]. A team from Australian University of Technology in Sydney found an active ingredient of Nigella sativa can prevent the SARS-CoV-2, the virus leading to Covid-19, from causing a lung infection. "There is growing evidence from modelling studies that thymoquinone, an active ingredient of Nigella sativa, more commonly known as the fennel flower, can stick to the Covid-19 virus spike protein and stop the virus from causing a lung infection [13].

To previous study showed that N. sativa significantly

Inhibited mast cell degranulation and reduced mast cells

Population induced by Tricholoma terreum [14]. Further-more, N. sativa seed extract also decreased intestinal mast cell numbers and plasma mouse mast cell protease-1 (MMCP-1) in the hypersensitive murine model [15]. In the form of oil, N. sativa significantly decreases airway hyper responsiveness through the reduced number of leukocytes, macrophages, eosinophil's, and levels of several asthma-related interleukins [16]. In addition, Khaldi et al. have demonstrated N. sativa oil administration had anti-inflammatory effects by reducing interleukin 4 (IL-4) and nitrite oxide (NO) production in rat asthma model [17]. In a single-blind randomized clinical trial, N sativa sup-plementation with inhaled maintenance therapy increase asthma control test (ACT) score, improve lung function and reduce IgE levels in partly controlled asthma [18]. Most properties are mainly attributed to Quinone constituents, of which thymoquinone is more abundant compound. Quinonic alkaloids are likely to be involved in

Pharmaceutical properties as well. Another use of N. Sativa seeds is as seasoning for foodstuffs like bread and pickles, especially widespread among Turkish people. Nigelladamascene is a less explored species. Its seeds have a mild aromatic flavor, slightly resem-bling that of strawberries, and they have been used in the past to garnish cakes and biscuits. Both N. sativa and N. damascena seeds contain a variable amount of oil, with linolenic generally recognized as the more abundant fatty acid; relevant amounts of saturated acids such as palmitic, myristic and stearic were found in some cases, as well as the presence of unusual unsaturated c20 acids (19).

An unusual character of Nigella seeds is the very high lipase content and the consequent high amount of free fatty acids [20].

II. NIGEGA SATIVA

MEDICINAL USES OF NIGELA SATIVA AND PHARMACOLOGICAL ACTION

CARMINATIVE EFFECT

NIGELA SATIVA seed not only aroma but also carminative they used digestion and relieve gases in stomach and intestine. [21].

Anti-microbial effect

Nigella sativa of ethanol extract show in vitro Anti-bacterial activity against methicillin resistant and sensitive strain of staphylococcus aureus. [22].

Anti Dermatophyte Effect

Nigella sativa is a highly potent source antidermatophyte Drug. Seed have mainly active principle, thymoquinone produced minimum inhibitory concentration (MIC₅₀) against 8 species of Dermatophyte. [23].

Anti-Oxidant Effect

Nigella sativa in mainly present Antioxidants include selenium, DL-alpha and DL- gamma tocopherol, all trans-retinol, thymoquinone and thymol [24].

Thymoquinone bind iron-dependent microsomal lipid per oxidation but did not cause DNA Damage. [25].

Anti- Inflammatory Effect

Thymoquinone who effect of Anti – Inflammatory, Supported BY the allergic airway inflammation stopping on TH2 Cytokines And Eosinophil Infiltration the airway and goblet cell Hyper Plassia . [26-27].

Antitumor Effect

Nigella Sativa of Seed and oil show Antitumor Effect In vivo and vitro. [28-29].

Anti-Convulsing Effects

Thymoquinone have an anti convulsant Activity they show an opioid receptor- mediated increase in GABA- argenic tone. [30].

Nigella Sativa on Nervous System

Nigella sativa seed show Narcotic Analgesic Activity they easily bind in opioid Receptor. [31].

Nigella Sativa oil from seed Show CNS Depressant and Highly Potent Analgesic Action .They was effect on Phenobarbitone –induced sleeping time. [32].

In another new investigation, the methanolic and aqueousextract of Nigella Sativa Seed produced in general behavior Pattern, reduction in normal body temperature and significant Action in analgesic hot plate And pressure test, suggesting CNS depressant Action. [33].

Nigella Sativa used in long term Administration to increase level of 5HT and improve on Memory Levelby Found in Rat. [34].

Administration of Nigella Sativa in oral route to Increase the NSO (Novel Synthetic Opioids)

Brain Level Of 5HT (Serotonin) But The level of Brain 5HIAA (Hydroxyl Indole Acetic Acid) decreased. Plasma Level also increasing (Tryptopen) Used is oral Administration of Regular.

Brain And Plasma level on tryptophan also increasing in used to regularly oral Administration of NSO. Drug ofuseful for anxiety. [35].

Thymoquinone have various type of property. Like Antihistaminic, Antimicrobial, Gastro Portative, Nephroprotective and Neuroprotetative Properties. [36].

Nigella Sativa its Bioactive Component in skin Wound Healing

Nigella Sativa has a medicinal herb in since the ancient time. They are mostly because in Islamic Based Medicine, Nigella Sativa have been mentioned by ProphetMuhammad PBUH as the cure of all diseases except Death. [37].

Nigella Sativa and thymoquinone they have a wide range of therapeutic effects mainly their Anti-inflammatory, Antioxidant, Anti-cancer, Anti-Microbial, Nephroprotective, and Neuroprotective that been revealed in various in vivo and in vitro studies. [38-39].

Now a day the burden of wound healing management high with the help of antibiotic – resistant bacteria than can impede the wound healing process. The use of natural product of Nigella sativa most effective for wound healing management. [40].

Dysmenorrhea

Dysmenorrhea is common complicated joints are Anxiety, Depression and Premenstrual Syndrome (PMS) [41-42].

In the study in vivo and in vitro to found Nigella Sativa High concentration of methanol extract inhibitory neurotransmitter Glutamate Neurons of Culture [43].

Nigella Sativa they are Beneficial for Effect in Dysmenorrhea. [44].

THE SARS – COV- 2 VIRUS AND ITS REPLICATION IN HOST PHENOCYTES

(CELL OF THE LUNGS)

Infect human are further class of

SARS-COV-2 is the class of corona virus that are further seven class they know as infected human. [45].

They are four in class of genera alpha-cov, beta-cov, gamma cov, delta cov. [46].

Beta cov they are belong in covid-19.[47]

Like another corona virus, SARS-COV-2 is also bind virus with a single (ONE) stand, positive since RNA Genome.[48].

Proteins have a variety of the replication of function they are required viral of RNA synthesis of caping,

Such as RNA Dependent

And RNA polymerase (RdRP: NSP12) a helicase (NSP13), RNA cap modifying methyl transfers (NSP 14 and NSP16) and an exoribonuclase (NSP14). [49].

16non- structural proteins (NSP5) in a four membrane of protein like spike (S), envelope (E), membrane (M) and Nucleocapsid (N).[50].

Beta-cov is commonly located in the C-terminal domain of the class of Receptor Binding Domain (RBD). [51]. While using S-glycoprotein, the SARS-COV₂ inhibits human angiotensin converting enzyme 2 (ACE2) Receptors on phenocytes. [52]. ACE2 receptor is also further expressed in the epithelial cells of alveoli, trachea, bronchi, bronchial serous glands, Alveolar monocytes and macrophages. [53].

Role of zinc in the human body

Zinc is widely spread in the human body and intracellular compartment like nucleus (30-40%), cytoplasm, and other organelles specialized vesicles (50%) with cell membrane proteins. [54]

In the human body, plasma maintains the important role of Zinc 10 and 18 mol/l representing 0.01% of total body weight of Zn. [55]

III. CONCLUSION

Seeds are natural drugs used to treat various diseases. WHO has already recognized the contribution of traditional health care in tribal communities. *Nigella sativa* is commonly known as black seed. The present review reveals that *Nigella sativa* is used in treating various diseases. *Nigella sativa* can prevent the SARS-CoV-2, the virus leading to Covid-19, from causing a lung infection. *Nigella sativa* seed and its ingredients are very effective in treating many ailments. Many studies have shown that *Nigella sativa* is mostly used as Antioxidant, Anti-microbial, Anti-inflammatory, Anti-convulsant, Anti-cancer, Anti-Dermatophyte, Anti-parasitic, Anti-hypertensive, Anti-Fungal. *Nigella sativa* provides an additional beneficial effect on the immune system along with breast cancer, fertility and dehydration. *Nigella sativa* seed shows Narcotic Analgesic Activity; they easily bind to the opioid Receptor. *Nigella sativa* oil from seed shows CNS Depressant and Highly Potent Analgesic Action. *Nigella sativa* may provide benefits for the treatment of asthma. In the form of oil, *N. sativa* significantly decreases airway hyperresponsiveness through the reduced number of leukocytes, macrophages, eosinophils, and levels of several asthma-related interleukins.

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