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Therapeutic Potentials of Kalonji Seeds *(Nigella sativa)* in Skin and Hair Disorders: A Review

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ABSTRACT

Kalonji (*Nigella sativa*) is a well known Unani drug used since centuries in a number of pathological conditions including skin diseases (*Amraze Jildiya*). Its therapeutic uses have been described in classical Unani literature. Kalonji is a widely used medicinal plant. It is an annual flowering plant that grows up to 20-30cm tall with finely divided, linear leaves. The flowers are delicate and usually colored white and pale blue, with 5-10 petals. The fruit is a large and inflated capsule composed of 3-7 follicles, each containing numerous seeds that are triangular in shape and black in color. These seeds have a slightly bitter and peppery flavor with a crunchy texture. It is cultivated in Punjab, Himachal Pradesh, Bihar, and Assam. The results of various scientific studies showed that Kalonji possesses anti-bacterial, anti-fungal, antioxidant, Antidiabetic, anticancer, immunomodulatory, anti-inflammatory, analgesic, cardioprotective, hepato-protective, nephroprotective, hair tonic properties. A number of compounds are prepared using kalonji such as *Jawarish Shoneez*, *Habb Hilteet*, *Majoon Kundur*, and *Majoon Kalkalanj*. Keeping in view the high medicinal importance of the drug in Unani medicine, the present review provides available information on traditional uses and pharmacological properties of Unani drug Kalonji.

Keywords: Unani medicine, Kalaunji, Nigellone, Hair growth, Thymoquinone

INTRODUCTION

Medicinal plants are being used therapeutically throughout the world for treating various ailments. Moreover, medicinal plants are also used in the preparation of herbal medicines as they are considered to be safe as compared to modern allopathic medicines. Many researchers are focusing on medicinal plants since only a few species have been thoroughly investigated for their medicinal properties, potential, and mechanism of action, safety evaluation and toxicological studies. Among the various potential medicinal plants, Kalonji is emerging as a multifunctional herb with a rich historical and religious background since many researches revealed its widespread spectrum of pharmacological potential. In one of the Prophet Hadith, it is mentioned that black seed is the remedy for all diseases except death.[1-4]

Kalonji is commonly known as black seed and is a native of Southern Europe, North Africa and Southwest Asia and is cultivated in many countries in the world like Middle Eastern Mediterranean region, South Europe, India, Pakistan, Syria, Turkey, and Saudi Arabia.[1,5]

According to classical literature, Kalonji is an annual flowering plant which grows up to 20-30cm tall, with finely divided, linear leaves. The flowers are delicate, and usually colored white and pale blue, with 5-10 petals. The fruit is a large and inflated capsule composed of 3-7 follicles, each containing numerous seeds which are triangular in shape and black in color. These seeds have a slightly bitter and peppery flavor with a crunchy texture. Kalonji is very popular throughout India. It is commonly found in Bihar, Bengal, Haryana and Punjab. It is also cultivated in neighboring countries.[1,2,5-7]

Taxonomical classification of *Nigella sativa*[1,2,5]

Kingdom	Plantae
Subkingdom	Tracheobionta
Subdivision	Spermatophyta
Division	Magnoliophyta
Class	Magnoliopsida
Order	Ranunculales
Family	Ranunculaceae
Genus	Nigella L.
Species	*N. sativa*

VERNACULARS[2,5,7-11]

Botanical name: *Nigella sativa* Linn.

English name(s): Small Fennel, Black cumin

Unani Tibbi name(s): Kalonji

Arabic name: Habbat ul sauda

Persian name: Shooneez, Siyah Dana

Regional names: Urdu: Kalonji, Kannada: Karijirige, Hindi: Kalaunji, Kalajira, Marathi: Kalaunji-Jire, Tamil: Karunjiragam, Telegu: Nallajilakara, Malayalam: Karinchrakam

Fig. No. 01: *Kalonji* Flowers

Fig. No. 02: *Kalonji* seeds

MORPHOLOGY

Macroscopic feature

The seeds are small, about 2-3 mm long and 1 mm wide, black, triangular, and tapering towards the umbilical side. The seed coat is rough and very thin (about 0.3 mm thick). It encloses a dull white, oily kernel. The seeds produce a characteristic lemon-like pleasant odor when crusted. Average weight of 100 seeds varies from 0.17 to 0.19 gm.[1,2,7,9]

Microscopic feature

A transverse section of seed under a microscope shows that the seed coat is a single layer of epidermis consisting of elliptical, thick-walled papillate cells, which is followed by 2-3 layers of thick-walled, tangentially elongated, parenchymatous cells. The seed coat is internally lined by a pigmented layer; the cells contain a blackish pigment. Next to the seed coat is the endosperm, which consists of moderately thick-walled rectangular to polygonal cells, a few filled with oil blobules, and also shows large, thin-walled parenchymatous cells of the embryo.[1,2,7,9]

UNANI DESCRIPTION

***Hasase mustamila* (Parts used):** Fruit, Seeds[7,12]

***Mizaj* (Temperament):** Hot 2^{o} Dry 2^{o} [7,10,13,14], Hot 3^{o} Dry 3^{o} [14-16]

***Af'aal* (Therapeutic actions):** *Jali* (Detergent), *Munzij* (Coctive), *Mudir-e-baul* (Diuretic), *Mudir-e-Haiz* (Emmenagogue), *Mudir-e-labn* (Galactogogue), *Musqit-e-Janeen* (Abortifacient), *Muhallil-e-Warm* (Antiinflammatory), *Mujaffif* (Desiccative), *Qatil-e-Kirm-e-shikam* (Antihelmentic), *Qatil-e-Jaraseem* (Anti-microbial), *Muahrrik* (stimulant), *Kasir-e-Riyah* (carminative).[1,2,7,9,11,13,14,16-18]

***Istemalat* (Uses):** *Ehtebaas-e-Haiz* (Amenorrhea), *Usrul Baul* (Dysuria), *Kirm-e-shikam* (Helminthiasis), *Idrar-e-Sheer* (increase lactation), *Istiqrar-e-Hamal* (Abortion), *Qooba* (Ringworm), *Jarb* (Scabies), *Bahek* (Scald), *Bars* (Vitiligo), *Da-us-salab* (Alopecia), *Busoor Labn* (Acne).[1,2,7,9,13,14,16-19]

***Nafa-e-Khas* (Main Function):** *Mudir Baul*, *Mudir Haiz*, *Yarqan*.[10,15]

***Muzir* (Adverse effect):** *Khunaq*, Headache,[10,14,16] Kidneys, Lungs.[13,16]

***Musleh* (Corrective):** *Kateera*,[7,10,14,16] Vinegar,[7,10,16] *Banslochan*, *Kasni*,[7,14] *Tukhm Khayar*.[13,14]

***Badal* (Substitute):** Ajwain Khurasani (*Hyoscyamus niger* L.)[7,14] *Anisoon*[10,13,14,16] Soya seeds[14,16]

***Miqdaar Khurak* (Dose):** 1-2gm,[9,10] Upto 3gms[1,7,13,14]

***Mash'hoor Murakkabat* (Important Unani formulations):**

Jawarish Shuneez, *Habb Hilteet*[7,10,20] *Majoon Kundur*,[9] *Majoon Kalkalanj*[7,9,10,20], *Majoon Fanjnush*[9]

Biochemical Constituents

Thymoquinone, Thymol, Thymohydroquinone, Stigmastanol, Nigellimine, Nigellicine, Lophenol, Gramisterol, Dithymoquinone, cycloeucalenol, Cycloarterol, Carvone, Nigellidine, Carvacrol, Nigellimine-N-oxide, Steroids/turpentine, tannin, alkaloids, glucosides, carbohydrates, Nigellone, Oleic acid, palmitic acid, Stearic acid, Linoleic acid, Linolenic acid, melanthin.[2,5-9,12,17,19-22]

Reported Pharmacological activities:

Nigella sativa has been broadly studied in the last decades, and various studies have reported that it possesses a number of medicinal properties and pharmacological actions.

1. Antibacterial activity:

Antibacterial effect against gram +ve and gram -ve bacteria is shown by various crude extracts of *Nigella sativa* seeds, essential oil, and due to presence of Thymoquinone (TQ), Thymohydroquinine and Melanin.

2. Antifungal activity:

Methanolic extracts, chloroform extracts, and bioactive compounds like Quinines, Dithymoquinone, Thymohydroquinone, and Thymoquinone of *Nigella sativa* and nano-particulated drugs like Amphotericin-B, Ketokonazole, and Thymoquinone have the strongest antifungal effect against different strains of *Candida albicans*.

3. Antioxidant activity:

Thymoquinone and methanolic extracts of seeds show significant antioxidant activity along with anti-inflammatory, anticancer, antibacterial, and antiarthritic activity in vivo and in vitro.

4. Antidiabetic activity:

The therapeutic potentials of α-lipoic acid, L-carnitine, and *Nigella sativa* combinedly contribute to a significant reduction in the elevated blood glucose level.[1-3,5]

5. Anticancer activity:

Thymoquinone has a beneficial effect in conditioning T cells in vitro for adoptive T-cell therapy against cancer and infectious disease. *Nigella sativa* seeds and extracts have cytotoxic effects in human breast cells.[3,5]

6. Immunomodulatory activity:

The potential immunomodulatory effects of aqueous extract, methanolic extract, and volatile oil of *Nigella sativa* seeds boost splenocyte proliferation, enhance WBC count, suppress primary macrophages, and enhance natural killer (NK) cytotoxic activity against tumor cells and lethal infections.[1,2]

7. Anti-inflammatory and Analgesic activity:

The aqueous extract of Nigella sativa was found to possess anti-inflammatory and analgesic activity. Thymoquinone has an anti-inflammatory effect during the allergic response in the lung by inhibiting the immune response.[2,3]

8. Cardioprotective activity:

Thymoquinone prevents decrease in platelet numbers and prothrombotic events and has cardioprotective effect. Pretreatment with Nigella sativa oil reduces heart injury, normalizes cardiac histopathology, and improves antioxidant enzyme status and cellular protein oxidation.[1,2,4]

9. Hepato-protective activity:

Nigella sativa intraperitoneally relieves the adverse effects of ischemia reperfusion injury on the liver. It protects hepatic tissue from harmful effects of toxic metals and reduces hepatic lipid peroxidation.[1,2]

10. Nephroprotective activity:

Vitamin C and Nigella sativa oil, when given in combination, have synergistic nephroprotective effects. It also protects renal tissue against oxygen free radicals, perculating renal dysfunction and morphological abnormalities.[1-3,5]

11. Skin problems:

The ethanolic extracts of Nigella sativa seeds have been evaluated for antipsoriatic effect. Many scientific studies have been done and observed the effects of Nigella sativa against acne vulgaris. Nigella sativa showed a decrease in the lesion size and proved to be effective in vitiligo. It can also be used for glowing skin, to treat blemishes, and to cure cracked heels.[4,5,21]

12. Hair problems:

Kalonji is one of the best natural treatments for managing hair loss, as it not only stops hair loss but also encourages hair growth. It is also used in the treatment of hair problems such as baldness, receding hairline, and dandruff and to treat dryness.[4,21]

CONCLUSION

The seeds of Kalonji have been used since times unknown to treat wide range of diseases. Kalonji seeds can be used in many skin and hair problems. It is mentioned as miracle, heals all ailments, except death. It has been subjected to phytochemical, experimental and clinical investigations and studies have established its anti-oxidant, anti-inflammatory, anti-microbial, hair growth promoter and follicular enlargement properties. Many scientific studies have proved the claims of traditional medicine. However, further detailed clinical researches have to be conducted to explore the full therapeutic potentials of this drug in order to establish it as a standard drug.

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