

Chapter-03

A COMPREHENSIVE REVIEW OF BADIYAN (FOENICULUMVULGARE) WITH REFERENCE TO UNANI AND ETHNOMEDICINE

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ABSTRACT

The perennial herb fennel, also known as shomar, is a member of the Apiaceae family and is employed in various medical systems, including Islamic and Greco-Arab medicine. It has yellow flowers and feathery leaves. It is utilized for its diuretic and therapeutic effects on the gastrointestinal tract as a pain reliever. Because of its ability to relax smooth muscles, *F. vulgare* is employed in Eastern Mediterranean countries. The scientific research is reviewed in this publication together with the pharmacognostical and therapeutic details.

Keywords: Shomar, Greco-Arab medicine, *F. vulgare*

1. INTRODUCTION

A perennial herb of the Apiaceae family, fennel is also known as Shomar. It is distinguished by feathery leaves and golden flowers. In addition to other medicinal systems, fennel has been frequently used in Islamic and Greco-Arab *medicine*. Its notable properties include its effectiveness as a laxative, muscle relaxant, and treatment for urinary disorders. Its cultivation is primarily driven by its aromatic qualities, culinary uses, and medicinal benefits. (Saad, B., & Said, O.2011). (Ghani, N. 2010).

2. TAXONOMICAL CLASSIFICATION

- **Kingdom:** Plantae
- **Phylum:** Spermatophyta
- **Class:** Dicotyledonae
- **Order:** Apiales
- **Family:** Apiaceae
- **Genus:** *Foeniculum*
- **Species:** *vulgare* (Shamkant *et.al*, 2014)

3. HABITAT AND DISTRIBUTION

The plant fennel, which is indigenous to Asia and Europe, is grown extensively around the world, especially in the US and the UK. In addition, it is grown in Russia, Germany, Poland, Egypt, Greece, Italy, Romania, India, Java, Japan, Persia, and other places. There are two varieties of fennel that are grown for their seeds: bitter and *sweet* (Greenish, H.G.1999), (Khory NR, and Katrak, NN. 1993).

i. MAHIYAT (morphology and macroscopic features)

Fennel is a robust biennial or perennial herb 1-3 meters high with a characteristic anise or liquorice scent. Mature plants have a thick, deep taproot from which erect, solid, glaucous green stems arise; 10-20 stems originate from a basal cluster in late winter, then die back the following September-November.

The bottom leaves are the biggest, decomposed, and alternating. The leaf sheath surrounds the stem at its base in the shape of an open cylinder. The base of the 7-14 cm long, longitudinally striate petiole encircles the stem. The major pinnae are oddly numbered, and the leaf blade is innately split into filiform, sharp, and blue-green lobes.

The terminal compound umbel of the inflorescence can reach a diameter of 20 cm, with smaller peduncles typically about 16 cm in length. Vestigial at the top of the ovary, the calyx is topped by five distinct, sub-ovate petals that are yellow in color and have a thin membranous protrusion on the ventral side of the midrib. The petals have a highly inflexed, notched apex.

There are five, roughly 1.5 mm long stamens; the pistil bears two styles, each with a stigma at the top and a stylopodium at the base of the ovary.

The fruit is a 3-8.5 x 2-2.5 mm, pale green or yellow-brown, ovoid-cylindrical, generally slightly curved schizocarp that splits into two mericarps at maturity. Each mericarp has five noticeable ridges with oil vittae in between the ridges. The seed is attached to the pericarp via the testa adnate. Fennel's most noticeable characteristic is the brown tissue that envelops the vittae. Anise seed is intensely scented throughout the entire plant (Ghani, N. 2010), (Khory NR, and Katrak, NN. 1993), (Chopra R N, Chopra IC 1994), (Fluckiger FA, Hanbury D 1874), (Hooker, J.D. 1982), (Ibn Baitar Ziauddin Abdullah bin Ahmad 1999/ 2000).

ii. HISAS-E-MUSTAMLA (Parts Used)

Fruit and Root.^{6, 15,2,12,17} (Ibn Baitar Ziauddin Abdullah bin Ahmad 1999/ 2000), (Hussain M. 1874), (Ghani, N. 2010).

MIZAJ (temperament)

Hot and Dry (2^o) (Kabiruddin M 2000), Ibn Sina. *Al Qanoon Fil Tibb*, Urdu trans. Kantoori GH (2015).

iii. MIQDAR-KHURAK (Dose)

5-7gram (Hakim MAH 1924) (Khan MA 2010). The recommended dose of fruit is 5-10g while10g (in decoction dosage form) (Kraft K, Hobbs C 2004).

6-22g (Dayal KS 1993).

Dose of seed syrup is one mithqal (approximately 3.6-4g) and root syrup is two to three mithqal (approximately 7.5-11g) (Hussain M. 1874).

iv. MUZIR ASRAT (Adverse Effects)

It produces headache, thirst and decreases libido. Some report shows that ingestion of *F.vulgare* is able to trigger allergic responses such as asthma and rhinitis. Seizures, pulmonary edoema, and vomiting are possible side effects of consuming the oil. (Hakim MAH 1924), (Dayal KS 1993), (Levy SB 1948), (Ghani, N. 2010), (Khan MA 2010).

v. MUSLEH (corrective)

Kishneez (*Coriandrumsativum*) and Sandal Safed (*Santalumalbum*) are used to prevent the adverse effects of Badiyan. Frying of fruits also detoxifies the drug. (Ghani, N. 2010), (Hussain M. 1874), (Fluckiger FA, Hanbury D 1874), (Kabiruddin M 2000).

vi. BADAL (SUBSTITUTE)

Javitri (Mace/*Myristicafragrans*) andTukhm Karafs (seedsof*Apiumgraveolens*) are utilized as a substituteof*F. vulgare*. (Anonymous UPI 1999), (Hussain M. 1874), (Ghani, N. 2010),(Khan MA 2010), (Fluckiger FA, Hanbury D 1874), (Hakim MAH 1924).

vii. MURAKKABAT (COMPOUNDFORMULATIONS)

Jawarish Zarwooni Sada, Sharbat Zoofa Murakkab, Halwa Chob Cheeni, Habb Maghz Badam, Arq Badiyan and Arq Murakkab are some Unani formulations in which the F.vulgare is used as an ingredient. (Kabiruddin M 2000), (Anonymous UPI 1999).

viii. AFA'AL(PHARMACOLOGICALACTIONS)

In Unani and Ethno-medicinal literatures F.vulgare (Badiyan) was described as Hazim (Digestive), Kasir Riyah (Carminative), Mufatteh Sudad (Deobstruent), Muqawwi Meda (Stomacich), Mudir Baul (Diuretic), Tiryaaq (Antidote), Muwallid Mani (Spermatogenic), Dafe Alam (Analgesic), ManeIltehab (Anti-inflammatory), Oestrogen stimulant, Dafe Tashannuj (Antispasmodic), Antifungal, Qatil Jaraseem (Bactericidal), Muscle relaxant, Mane Qai (Antiemetic), Muhafiz Jigar (Hepatoprotective), (Khory NR, and Katrak, NN. 1993), (Kirtikar, K. R., & Basu, B. D. 1999), (Hussain M.1874), (Chopra

R N, Chopra IC 1994), (Khan MA 2010), (Hooker, J.D. 1982), (Nadkarni AK 1994), (Dayal KS 1993), (Gould F 2003), (Ravindran PN 2018), (Fluckiger FA, Hanbury D 1874).

ix. ISTEMALAT (THERAPEUTIC USES)

From ancient times, the drug was used in phlegmatic and melancholic diseases, stomach pain, flatulence and urinary disorders. Decoction is useful in palpitation, cough and difficulty in breathing. It is also used to increase breast milk, libido and menstrual irregularities. (Khory NR, and Katrak, NN. 1993), (Kirtikar, K. R., & Basu, B. D. 1999), (Hussain M.1874), (Chopra R N, Chopra IC 1994), (Khan MA 2010), (Hooker, J.D. 1982), (Nadkarni AK 1994), (Dayal KS 1993), (Gould F 2003).

x. KIMIYAWI AJZA (Phyto Chemical Constituents)

The main constituents of F. vulgare are an essential oil (upto 6 percent) with an ethole and fenchone, fattyoil, proteins (9.5%), carbohydrates (42.3%) and mucilage, alpha pinene, camphene, limonene, potassium fiber, calcium, vitamin C, flavonoids, a glycine and glycoside.

4. CARDIO-PROTECTIVE ACTIVITY

The vascular effects of *Foeniculum vulgare* leaf aqueous extracts were investigated by Amin et al. (1988) on rats that had been given a pento barbital anaesthesia. They have the capacity to act on the heart. By injecting lyophilized boiled water extract of fennel leaves intravenously, arterial blood pressure was significantly reduced in a dose-related manner without compromising heart rate or respiration rate. Very little hypotensive activity was observed by non-boiled aqueous extract. (Amin et.al.1988).

Natrajanet.al., (2019) studied hydro alcoholic extract of F, vulgare on isoproterenol induced myocardial infarction by administrating three diverse doses of F. vulgare extract (200mg/kg,250mg/kg,400mg/kg p.o. respectively) for 30 days in albino rats. Various biochemical measures were used in the investigation. such as SGOT, CPK,CRP, LDH,Urea, creatinine, blood sugar, LFT, lipid profile test and levels of glutathione and lipid peroxide in liver and heart tissue were analyzed and found that the level of diagnostic marker enzymes were increased in ISO control group whereas significantly decreased in the drug treated rats. The isoproterenol-treated control group showed moderate to severe histological changes, while in the drug-treated group, there was remarkable improvement in sections of heart architecture.

i. Anti-oxidant Activity

Faudale *et al.*, (2008) evaluated the total phenolic and flavonoid content as well as the antioxidant activity of edible, medicinal, and wild fennel by free radical (DPPH), hydroxyl radical, and superoxide anion scavenging activities. They found that wild funnel exhibits a radical scavenging activity and a total phenolic and flavonoid content, higher than those of both medicinal and edible fennels.

ii. Bronchodilatory Effect

(Boskabady *et al.*, 2004) studied *F.vulgare* inhibitory effect on contracted tracheal chains of guinea pig. The relaxant properties of *Foeniculum vulgare* essential oil and ethanolic and aqueous extracts were compared to negative controls and a positive control (diltiazem) using isolated tracheal chains of the guinea pig. In the group 1 experiments, diltiazem, ethanol extract, and oil from *Foeniculum vulgare* showed a significant relaxant effect on methacholine induced contraction of tracheal chains compared to those of negative controls. (Boskabady *et al.*, 2004).

iii. Diuretic Activity

The ethanol extract of the dried ripe fruit of *Foeniculum vulgare* (500mg/kg) was tested by Tanira *et al.*, (1994) for diuretic, analgesic, antipyretic, antimicrobial, cytotoxic activities and its consequence on bile secretion in rats. Also, the adverse effect after 0.5, 1 and 3g/kg was investigated in mice. This study also showed analgesic, antipyretic activities and it enhanced bile secretion (Tanira MOM *et al.* 1994).

iv. Competing Interests

The authors declare that there are no competing interests regarding the publication of this paper.

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