Surajmukhi (*Helianthus annuus* L.): Medicinal Importance in Unani Literature and Modern Evidence

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Abstract

Helianthus annuus L. (Sunflower), belonging to the family Asteraceae, is a well-recognized plant in both traditional and modern systems of medicine. In Unani medicine, it is described under the name "Shams-ul-Nahar," attributed with specific Mizaj (temperament) and pharmacological actions. The plant is considered to possess a hot and moist temperament (Har Ratab), and different parts, including its seeds, oil, and leaves, have been employed in classical formulations. Sunflower seeds are recognized as nutritive, demulcent, and mild laxative, while the oil is valued for its emollient, anti-inflammatory, and cardioprotective properties. The flower has been mentioned for its analgesic and diuretic potential. However, Unani scholars also caution its use in individuals with hot temperament and in disorders related to the spleen, indicating a nuanced therapeutic application. Contemporary pharmacological studies corroborate many of these traditional claims, demonstrating antioxidant, anti-inflammatory, hepatoprotective, and antimicrobial activities of H. annuus. This integration of Unani concepts with modern evidence highlights the significance of sunflower as a medicinal plant with potential applications in gastrointestinal, cardiovascular, and inflammatory disorders. Further scientific validation and clinical research are warranted to

standardize its use and to ensure safe therapeutic application in alignment with the principles of Unani medicine. **Methodology:** This is a narrative review article. Unani classical literature such as Al-Qanoon fi'l-Tibb, Khazain al-Advia, *Makhzan-ul-Mufradat Nadkarni KM – Indian Materia Medica*, were manually searched in the central library of National Rearch Institute of Unani Medicine for skin Disorders, Hyderabad and Qamar liberary Deoband Unani Medical College Hospital & Research Centre. We also searched online bibliographic databases such as pubmed, google scholar.Standard Unani Medical Terminology published by Central Council for Research in Unani Medicine, New Delhi was referred to describe the Unani terminologies. **Result:** In this `study , 11 classical Unani books , 4 original research article, and 5 review article were reviewed. It has been found that famous Unani scholar like *Ibn-Sina* and *Najmul Ghani* have documented the medicinal use of *Gul-e-Aftab* in their books. Sunflower plant is a annual herb with a herbaceous (non woody) stem. The scientific name *Helianthus annuus L.* comes from the Greek words helios (sun) and anthos (flower), referring to the sunflower's sun-like appearance and its *heliotropic* behavior, and the *Latin* word *annuus* meaning annual, distinguishing it from perennial sunflowers. In Classical Unani Literature *Gul-e-Aftab* commonly known as Sunflower, is a well-known ornamental and medicinal plant. The name reflects its heliotropic nature- the flower follows the movement of the sun. In Unani medicine, it is valued for both its nutritive and therapeutic properties. The plant provides seeds, oil, flowers, and leaves as medicinal parts. Seeds are rich in oil, proteins, and minerals, making them an important source of nutrition and medicine. Oil is used both internally and externally in various ailments. *Gul-e-Aftab* has been reported for numerous pharmacological activity such as *anti-inflammatory, anti-oxidant, antitumor, anti-asthmatic, antigen, antipyretic, astringent, anti-hypoglycemic effect, cathartic, diuretic, stimulant, vermifuge, antimicrobial activities,* and *vulnerable purposes*. The cosmetics business has a new future because to the usage of yellow petals as coloring ingredients. Other plant parts, petioles, and young flowers are used as savory treats According to Unani texts, Sunflower seeds and oil used in cardiac weakness and hypertension (due to vasodilatory and lipid-lowering properties). Seeds are employed as nutritive, diuretic, and expectorant. Its oil applied externally for rheumatic pains, ulcers, and skin disorders. Sunflower flowers are used as febrifuge (anti-pyretic). And its leaves used in some formulations as wound healer and anti-inflammatory.

Keywords: *Helianthus annuus* L. Sunflower, Surajmukhi, Unani medicine, Mizaj, Traditional medicine, Pharmacological activities, Anti-inflammatory, Cardioprotective.

Introduction: The sunflower (*Helianthus annuus* L.), a significant annual herbaceous plant that is native to North America and is currently grown extensively worldwide, is a member of the *Asteraceae (Compositae) family*. It is known for having big, radiating, bright yellow flowers that mimic the sun; this is why it is called "*sunflower.*" In addition to its nutritional and economic benefits, the plant is prized for its aesthetic and therapeutic qualities.[1] The *phenolic chemicals, flavonoids, polyunsaturated fatty acids*, and *vitamins* in *sunflower seeds* and sprouts provide important *anti-inflammatory, anti-hypertensive, anti-oxidant, anti-microbial, wound-healing*, and *cardiovascular effects.*[2]. The extensive use of plant extracts to treat illnesses has raised interest

in identifying the key ingredients that give the extracts their therapeutic properties.[3] The *sunflower*, which is utilized as food and medicine all throughout the world, is the foundation of medicinal benefits. The primary reason *H. annuus* is grown is for its seeds, which provide the second-most significant source of edible oil in the world. Other plant parts, such as the petioles and young flowers, are used as savory treats. The herb tincture, seed oil, and shoots are used for *anti-inflammatory, anti-oxidant, anti-tumor, anti-asthmatic, antigen, antipyretic, astringent, anti-hypoglycemic* effect, *cathartic, diuretic, stimulant, vermifuge, antimicrobial activities,* and vulnerable purposes. The cosmetics business has a new future because to the usage of yellow petals as coloring ingredients.[4]

In unani system of medicine, Sunflower (*Helianthus annuus L.*) known as *Gul-e-Aftab-parast*, *Shams-ul-Nahar* in Arabic and *Surajmukhi* in Urdu/Hindi. It is widely cultivated for its ornamental beauty and medicinal as well as nutritional values. according to unani medicine sunflowers, especially its seeds and oil, have the following properties like that, Deobstruent or *mufatteh-e-sudad*, aids in clearing obstructions from vessels, *Musakkin* (pain reliever) sedative, *Mulattif* (softening, demulcent), diuretic *(Mudirr-e-Baul)* Antidote or anti-toxic (*Dafe'e-Samoom*) Nerve tonic (*muqawwi-e-Aasab)*.[5, 6]

Vernacular names [6,7,8,9]

Gul-e-Aftab has been found in different parts of the world and is used as traditional medicine such as Chinese medicine and Persian medicine for various therapeutic purposes. It is known in different geographical regions by its different local names. Vernacular name & Taxonomical classifications are given in the Table 1&2

Table 1. Vernacular Names of Helianthus annuus (Sunflower)

Language	**Synonyms**	**Language**	**Synonyms**
Urdu	*Gul-e-Aftab*	**English**	*Sunflower*
Hindi	*Surajmukhi*	**Sanskrit**	*Surya-mukhi*
Arabic	*Shams-ul-Nahar*	**Persian**	*Gul-e-Aftab*
Bengali	*Surjomukhi*	**Gujrati**	*Suryamukhi*
Punjabi	*Surajmukhi*	**Tamil**	*Suryakanti*
Telugu	*Podda-tige*	**Unani**	*Gul-e-Aftab*
Kannada	*Podda-tige*	**Malayalam**	*Sooryakanthi*
Marathi	*Surajmukhi*		

Table 2. Taxonomical classification [4]

Kingdom	Plantae	**Division**	Angiospermae
Sub-division	Eudicots	**Class**	Asteroids
Order	Asterales	**Family**	Asteraceae
Sub family	Helianthoideae	**Scientific Name**	*Helianthus annuus* L.

Botanical Description:

Helianthus annuus L. (Figure 1) is a common annual plant that is rigid and fat, growing to a height of one to three meters. When the plant reaches maturity, its tap roots give way to enormous, fibrous, lateral roots. This plant has spherical, unbranched, hispid stems that range in height from one to six feet. The number of internodes determines the stem length. The arrangement of the leaves is such that the top leaves alternate down the stem and the lower leaves are primarily opposite. The majority of leaves are oval in shape, with an apex that is sharp to abruptly acuminate, edges that are serrated, and leaves that are at least 4–20 cm long and 3–15 cm wide. This plant's inflorescence consists of a capitulum composite heads with ray and disc florets present, either solitary at the peduncle's end or terminal on a branch or axillary. Ray blooms have yellow ligules and are sterile, measuring 0.6 to 1.6 inches in length. Perfect disc flowers with five corolla lobes that are tubular, purple-brown to yellow, and 0.2–0.3 inches long. The ovary is inferior in disc flowers, and the pappus is two and deciduous. An achene is the fruit of H. annuus. Achenes range in size from 14 to 13 mm in width and 7 to 25 mm in length. [10]

Figure 1. Sunflower (*Helianthus annuus L.*)

Cultivation of Sunflower (*Helianthus annuus* L.)

Sunflower (Helianthus annuus L.), an important oilseed crop, can be cultivated successfully under diverse agro-climatic conditions due to its short duration and photo-insensitivity. The crop performs best in tropical to subtropical regions, requiring a temperature range of 20–25 °C for germination and 25–30 °C for vegetative growth and seed development (Figure 2). Deep, well-drained loamy soils rich in organic matter, with a pH between 6.0 and 7.5, are considered ideal.

Land preparation involves ploughing the field two to three times to achieve a fine tilth, followed by the incorporation of farmyard manure (8–10 t/ha). A seed rate of 8–10 kg/ha with a spacing of 45 cm × 20 cm is recommended. Depending on the region, sowing is undertaken during three major seasons: kharif (June–July), rabi (October–November), and summer (January–February). Fertilizer application generally follows the N:P:K ratio of 60:60:40 kg/ha, with phosphorus and potassium applied at sowing and nitrogen split between sowing and 30 days after sowing.

Figure 2. Sunflower Seeds

Adequate soil moisture is critical, particularly during flowering and seed-setting stages; therefore, four to five irrigations are usually required. Weed control can be achieved through two manual weedings (20 and 40 days after sowing) or by pre-emergence herbicide application (e.g., pendimethalin at 1 kg/ha). Common pests such as the capitulum borer and hairy caterpillar, and diseases like Alternaria blight, downy mildew, and rust, can be managed through resistant cultivars, crop rotation, seed treatment, and appropriate plant protection measures.

Harvesting is performed when the back of the capitulum turns yellow and bracts turn brown. The harvested heads are dried, and seeds are separated by threshing. Under optimal conditions, the average seed yield ranges from 1.5 to 2.0 t/ha.

Mizaj (Temperament) [5,6,9,11]

Har Ratab (Hot & Moist) 2^0

Seeds are considered slightly hot and moist.

Therapeutic Dosage (*Miqdār-i-Khurāk*) [12,13,14]

The decoction of leaves, roots, and flower juice is administered in a dose ranging from 3½ masha (~3.4 g; ≈3.4 mL for aqueous preparations) to 10 tola (~116.6 g; ≈117 mL).

The powder (*Sufoof*) is administered in a dose of 4 masha (~3.9 g) to 7 masha (~6.8 g).

Seed Oil (*Roghan*) 5–10 mL orally; externally applied as needed for massage, wounds, skin conditions.

Flowers (*Gul-e-Aftab*) Used in infusion/tea; 3–6 g dried flowers.

Mazarrat (Adverse Effect): Sunflower is regarded as harmful for individuals with hot temperaments, and its adverse effects are particularly pronounced on the spleen.

Correctives (*Muslih*): Sikanjabeen, Shahad (honey)

Substitute (Badl): Zafran (*Crocus sativus,* Saffron), Sulaikha *Carthamus tinctorius L.*(Safflower).

Adverse effect, allergic reaction and toxicity:

According to Traditional Unani Literature and formularies do not explicitly list adverse effects for *Helianthus annuus* unlike some other herbs, Unani literature largely emphasizes its therapeutic uses as brain or heart tonic and does not documented specific contraindications or side effects.

Adulterants or Substitutes of Sunflower : [13, 14, 15]

Sometimes petals of other yellow flowers such as *Tagetes erecta (Genda phool* or *Marigold)* or *Calendula officinalis (Zergul)* are mixed with *Gul-e-Aftab* due to similarity in color. Powdered flowers are also adulterated with dyed dried petals of cheaper plants. Adulteration lowers therapeutic potency because sunflower mizaj is Har Yabis - Hot & Dry has specific actions (Mufarreh, Musaffi-e-Dam), which differ from marigold or calendula.

Adulteration in Sunflower Oil. [15, 16, 17, 18]

Sunflower oil is highly prone to adulteration with cheaper oils such as *Safflower oil (Carthamus tinctorius)* because of its very similar fatty acid profile. *Soybean oil (Glycine max), Cottonseed oil (Gossypium herbaceum), Corn oil (Zea mays), Sesame oil (Sesamum indicum*), Mineral oil hydrocarbons (MOH) (harmful, industrial adulterant).

Detection Methods of Adulterants

GC–FID (Gas Chromatography–Flame Ionization Detector) → detects TAG & fatty acid profiles.

FT-IR Spectroscopy → quick screening for adulteration.

HPTLC (High Performance Thin Layer Chromatography) → fingerprinting of mixed oils.

LC–QTOF MS → metabolomic biomarkers of sunflower vs other oils.

The therapeutic actions, scientific validation, pharmacological studies of the compound formulation, and pharmacological activities of *Helianthus annuus* are presented in **Tables 3–6**, respectively.

Table 3. Therapeutic Action: [5, 6 7,12]

Unani Term	**Pharmacological Action**	**Therapeutic Significance (Unani Concept)**
Mufarreh	Cardiac and mental exhilarant	Uplifts mood, provides calmness, and strengthens the heart and mind
Dafʿ-e-Tashannuj	Antispasmodic	Relieves muscular cramps and spasms
Musakkin-e-Hararat	Relieves excessive heat	Beneficial in hot temperaments and febrile conditions
Mudirr-e-Bawl	Diuretic	Promotes urine output and relieves urinary retention
Musakkin-e-Alam	Analgesic	Relieves pain, particularly headache
Munawwim	Mild sedative	Induces sleep and relaxation
Daʻf-e-Hiddat-e-Dam	Blood purifier	Reduces excessive heat and corrects bilious disorders

Istimālāt (uses)

Suda' (صداع / Headache), *Humma Harra* (حرّہ حمّی / Fevers with heat), *Atash* (عطش / Excessive thirst), *Tashannuj* (تشنج / Spasms & Convulsions), Sual (سعال / Cough), *Khafqan* (خفقان / Palpitation.

Table 4. Scientific validation [19,20,21,22,23,24,25]

Part Used	**Traditional Medicinal Uses**	**Pharmacological Uses**	**References**

Seeds	Used as food, nutritive tonic, aphrodisiac in Unani medicine	Rich in oil (linoleic & oleic acid), lowers cholesterol, antioxidant (Vitamin E), improves cardiovascular health, immunomodulatory	Ghafoor et al., 2017; Duke, 1992
Seed Oil	Applied externally for wounds and skin disorders; used as base oil in Unani formulations	Edible oil, hypocholesterolemic, anti-inflammatory, skin protective (cosmetic industry)	Nandha & Kaur, 2014
Leaves	Decoction used as antipyretic, expectorant, and to reduce swelling	Contains phenolics & flavonoids – antioxidant, antimicrobial, anti-inflammatory	Taha et al., 2016
Flowers (Petals)	Infusion used as diuretic and expectorant in folk medicine	Rich in carotenoids (lutein, zeaxanthin) – good for eye health, antioxidant, cosmetic coloring agent	Nandha & Kaur, 2014
Roots	Decoction traditionally used as febrifuge and for respiratory disorders	Contains sesquiterpene lactones – cytotoxic, antitumor, anti-inflammatory	Duke, 1992
Stem	Ash of stem used in soap and glass-making (folk uses)	Source of cellulose, biofuel production, and antimicrobial potential (due to coumarins & tannins)	Taha et al., 2016
Whole Plant	Used as fodder, diuretic, and febrifuge in traditional medicine	Allelopathic properties (weed management), phytoremediation of heavy metals (cadmium, lead)	Nandha & Kaur, 2014

Table 5. Pharmacological studies of compound formulation

Plant part	Phytochemicals	Pharmacological Role	Unani Formulations	Refrence
Seeds	Linoleic acid, Oleic acid, Palmitic acid, Stearic acid, Tocopherols (Vit. E), Proteins (albumins, globulins),	Hypolipidemic, Antioxidant, Cardioprotective, Nutritional	Majun Ard Khurma, Majun Murraweh-ul-Arwah, Majun Pumba Dana, Majun Jiryan Khas, Majun Sa‘lab	Ghafoor et al., 2017; Duke, 1992 Medisure Unani Materia Medica;

	Phytosterols (β-sitosterol, campesterol, stigmasterol)			Nandha & Kaur, 2014
Seed Oil	Linoleic acid, Oleic acid, Tocopherols, Phytosterols	Nutritional, Hypocholesterolemic, Skin-protective	Used externally in Roghan formulations	Ghafoor et al., 2017 Duke, 1992; Taha et al., 2016
Leaves	Chlorogenic acid, Caffeic acid, Quercetin, Kaempferol, Luteolin, Tannins	Antioxidant, Anti-inflammatory, Antimicrobial	Decoctions sometimes included in **Sharbat** or infusion for fever, cough, respiratory disorders	Nandha & Kaur, 2014
Flowers (Petals)	Carotenoids (Lutein, Zeaxanthin), Flavonoids	Eye health, Antioxidant, Anti-aging	Used in **infusions** for diuretic, expectorant effect (noted in folk/Unani practice)	Taha et al., 2016
Roots	Sesquiterpene lactones (Helianolide, Annuolide), Polyphenols	Cytotoxic, Antitumor, Anti-inflammatory	Rarely in formulations; decoction used as febrifuge & anti-inflammatory	Duke, 1992 Nandha & Kaur, 2014
Stem	Phenolic compounds, Coumarins (Scopoletin, Umbelliferone), Tannins	Antimicrobial, Anti-inflammatory		Duke, 1992

Table 6. Pharmacological Activities of *Helianthus annuus*

Pharmacological Activity	**Part Used**	**Experimental Model**	**Dose / Form**	**Reference**

Antioxidant	Seeds, leaves, flowers	In vitro (DPPH, ABTS, FRAP assays)	Ethanolic and methanolic extracts (50–200 µg/mL)	Nandha & Kaur, 2014
Anti-inflammatory	Leaves, roots, oil	In vivo (rats, carrageenan-induced paw edema)	Ethanolic leaf extract (200–400 mg/kg, oral)	Taha et al., 2016
Hypolipidemic Cardioprotective	Seed oil	In vivo (hyperlipidemic rats)	Sunflower seed oil (4–8 mL/kg/day)	Ghafoor et al., 2017
Antidiabetic	Seeds	In vivo (streptozotocin-induced diabetic rats)	Ethanolic seed extract (200–400 mg/kg, oral)	Nandha & Kaur, 2014
Antimicrobial	Leaves, petals, oil	In vitro (disc diffusion, MIC) against *S. aureus*, *E. coli*, *Candida albicans*	Methanolic extract (50–200 µg/mL)	Taha et al., 2016
Cytotoxic / Antitumor	Roots (sesquiterpene lactones)	In vitro (HeLa, MCF-7 cancer cell lines)	Root extract / isolated lactones (10–100 µg/mL)	Duke, 1992
Wound healing	Seed oil	In vivo (excision wound model in rats)	Topical application of sunflower oil (daily)	Nandha & Kaur, 2014
Immunomodulatory	Seeds (polysaccharides)	In vivo (mice, macrophage activation assays)	Seed extract (50–200 mg/kg)	Ghafoor et al., 2017

Discussion

Surajmukhi (Helianthus annuus Linn.), or sunflower, holds dual significance in Unani and modern medicine. Classical Unani texts describe it as possessing a cold and dry temperament

(Barid Yabis Mizāj), with its seeds recognized as nutritive, demulcent, and expectorant, useful in respiratory ailments and bilious disorders. The oil is applied as an emollient and resolvent for skin diseases and joint pain, while decoctions of leaves and flowers are prescribed for fevers, cough, and urinary complaints.

The convergence of Unani wisdom with modern pharmacological evidence highlights sunflower as both a therapeutic agent and functional food. Its traditional uses as an emollient, febrifuge, and expectorant align well with its scientifically proven pharmacological actions, underscoring the relevance of integrative approaches. Future directions should focus on standardization, clinical validation, and safety profiling to promote broader acceptance of Surajmukhi in contemporary healthcare systems.

Conclusion

In Unani medicine, *Helianthus annuus* (Sunflower) holds therapeutic significance owing to its diverse pharmacological attributes, nutritional richness, and compatibility with classical concepts of health maintenance and disease management. Its seeds, oil, and other parts are recognized for properties such as musakkin (sedative), muqawwi qalb (cardiotonic), mulattif (demulcent), and mufatteh sudad (deobstruent), which align with both preventive and curative aspects of Unani therapeutics. Modern scientific evidence further validates its antioxidant, anti-inflammatory, hypolipidemic, and wound-healing activities, bridging traditional knowledge with contemporary pharmacology. Thus, Sunflower exemplifies the integrative potential of Unani pharmacotherapy, offering scope for its wider application in evidence-based practice and future drug development.

Conflict of Interest: None

Source of Finding: None

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