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Therapeutic Insights Into Iris Ensata Thunb. (Irsa): Bridging Unani Wisdom And Modern Pharmacology

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Abstract: Medicinal plants have been used to improve human health with little side effects. Iris ensata Thunb. Irsa (Iridaceae) East Asian native is important in Unani medicine with multiple therapeutic activities. Considered a deobstruent (Mufatteh e Sudad), expectorant (Mukhrij e Balgham), phlegm expelling agent (Mushil e Balgham) and antiseptic (Dāfi‘ e Ta‘affun), it is extremely popular when it comes to treating respiratory and inflammatory diseases. Unani formulations contain the rhizomes of Irsa to relieve nasal congestion, rhinitis, sore throat, respiratory discomfort, and ulcerative lesions.

Phytochemical research has identified several active compounds, such as isoflavones, tannins, triterpenoids, phenolic acids, and essential oils, which have proven pharmacological properties: anti inflammatory, antimicrobial, hepatoprotective, bronchodilatory, and antiallergic. These results confirm synergy between the Unani traditional applications and the emerging scientific evidence. However, the existing evidence is still insufficient because there are several clinical trials and no standardized formulation yet.

This review addresses the botanical characteristics, traditional applications, chemical profile, and pharmacological potential of Irsa and its applicability in ancient and modern environments. Despite the encouraging research findings about the potential therapeutic potential, it is important that its safety, effectiveness, and mechanism of action are validated through rigorous pharmacological tests and clinical trials. A combination of Unani wisdom and scientific validation may open the door to evidence based herbal medicine prepared using Iris ensata.

Keywords: Irsa, Iris ensata thunb., medicinal plants, phytochemicals, Unani medicine.

I. INTRODUCTION

Since ancient times, medicinal plants have been at the roots of traditional medicine, and they were the main sources of therapy of a number of human diseases because of their medicinal value and the comparatively small number of side effects. Among these, a perennial herb of the family Iridaceae, Irsa (Iris ensata Thunb.) occupies an important position in Unani medicine. It is also characterized by a variety of pharmacological effects in the treatment of respiratory, inflammatory, and obstructive diseases.

Irsa is defined in the classical Unani literature as a strong Mufatteh-e-Sudad (deobstruent), Mushil-e-Balgham (phlegm-expelling), Mukhrij-e-Balgham (expectorant), and Dafi‘-e-Ta‘affun (antiseptic). It has been historically used in treating diseases like nasal obstruction, catarrh, sore throat, bronchial irritation and chronic ulcers. Importantly, Unani physicians have integrated Irsa into formulations of compounds like the Qurs-e-Bazrulbanj and the Lauq-e-Katan in an attempt to improve their mucolytic anti-inflammatory effects.[1, 2,3]

The plant, which was botanically named Iris ensata Thunb., is indigenous to East Asia and has been grown in both temperate and subtropical regions both as an ornament and in medicine. The principal component that is medically used and has received scientific attention owing to its abundance of phytochemical compounds is the rhizome. Many of the traditional claims have been corroborated by preliminary studies which have reported the presence of isoflavones, phenolic compounds, tannins, triterpenoids and essential oils.[4, 5]

Due to its wide range of conventional applications and the presence of new scientific evidence, Iris ensata deserves a thorough analysis to unify classical and current pharmacological results. The purpose of this review is to discuss the traditional use, botanical properties, phytochemical profile and pharmacological activity of Irsa and call on additional experimental and clinical research.

METHODOLOGY:

The method adopted in this integrative review was qualitative and aimed at synthesising the traditional information of Unani and modern scientific information regarding Iris ensata thunb.(Irsa). Nomenclature, temperament (Mizaj), therapeutic actions, medicinal uses and formulations were consulted in classical texts of Unani medicine like Khazain-ul-Advia (1921), Makhzan-ul-Mufradat (1936) and the National Formulary of Unani Medicine (2006). The name of the plants, distribution, part used and chemical components were found in standard pharmacognosy sources such as Indian Materia Medica (Nadkarni, 2002) and the Pharmacognosy (Trease and Evans, 2009).

Electronic databases PubMed, Google Scholar and ScienceDirect were used to access modern scientific literature by searching by key words (Iris ensata thunb., Irsa, Unani medicine, phytochemistry, and traditional uses) and excluding articles published after June 2025. The criteria used to include data included traditional uses, phytoconstituents, pharmacological activities, and therapeutic relevance. Scholars whose methodology was not clearly stated, duplicate studies, or studies that did not coincide with classical sources were omitted. The information obtained was categorized thematically in large sections: Unani traditional applications; botanical/pharmacogenostic profile; phytochemistry; pharmacological activity; and therapeutic potential.

RESULTS

Table 1: Scientific classification: [6,7]

Kingdom	Planta
Phylum	Angiosperm
Class	Monocot
Order	Asparagales
Family	Iridaceae
Genus	Iris
Subgenus	Limniris
Species	Iris ensata
Botanical name	Iris ensata thunb.

Vernacular Names:[6, 7]

Arabic : Urooq-us-Sosan

Persian: Bekh-e-Sosan,Asmanjoni, Bekh-e-Bansfsha

Hindi: Irsa, Sosun

Kashmiri: Krishun, Marjal Unarjal

Urdu: Irsa

HISTORY :[8, 9]

Irsa (Iris ensata Thunb.) belong to the family Iridaceae, use of the drug 'Irsa' in Unani system of medicine dates back about a couple of thousands of years. It was mentioned First in kitabul Hashaish by Dioscorides (1st B.C.) It is also mentioned by Theophrastus and was not disregarded through the Arabic, Persion and Urdu authors in their books. It Was particularly mentioned by Razi (926 A.D.) Ibne Sina (1037 A.D.) AI- Hawi (10th A.D). Irsa means the Rainbow, it is a Greek name as proved and was named after the especial Characteristic of its flowers. About a dozen species occur in India and a few exotics are cultivated for ornamental uses.

Fig 1: Dry roots of Iris ensata thumb.

Fig 1: Dry root powder of Iris ensata thumb.

COLLECTION AND CULTIVATION: [10]

Iris plants can easily be grown through seed, and also through rhizome divisions of old rhizomes. They grow well in a wide range of soils, but the plants in relatively dry and gravelly conditions produce highly fragrant rhizomes. The rhizomes are collected after approximately three years, stripped of their roots and aerial components and dried. The new rhizomes are odourless and acrid, but in the time-consuming drying process they lose their acridity and acquire the typical aromatic smell, which is similar to violets. In favourable conditions, 5-6 tons of dry rhizomes per acre is yielded after every three years. Kashmir, Europe and the Mediterranean region found them, but they were mainly grown in Italy.

DESCRIPTION: [5,8,9,10,11,39]

Macroscopic: Iris is a rhizomatous perennial plant that grow slowly expand up to 2-4' tall.

Rhizomes: prostrate, stout, creeping.

Leaves: ensiform, 25-70 cm long, straight, tough with prominent midrib, margin scarious, end acuminate, base dark purple.

Stems: Aerial, tufted, short, 20-100 cm high, stout or slender, with one terminal or lateral head; spathes 3, unequal, lanceolate, 4-7.5 cm long, 1-3 flowered, veins distinct, raised; the basal spathe shorter, apex generally acute; the apical spathe longer, apex generally obtuse.

Flowers: lilac or reddish purple; pedicel 1.5-3.5 cm long. purplish-veined, stalked falls.

Perianth tube: none or very short; blade of falls rhomboidly ovate, entire, shorter than the claw, molted yellow at centre; stands erect, oblanceolate.

Stamens: 3.5 cm long, Anthers: purple.

Ovary: cylindric; style purple, 5cm long. Capped, 6- ribbed, beaked.

Seeds: reddish brown, semi orbular, flat.

Roots: Root of Iris ensata Thunb. Are brown flakes of various forms but generally they are long with transverse wrinkles. It is pungent in odour and slightly bitter and aromatic in taste.

Flowering period: May-July

Altitudinal range: 1600-2600 m

Chromosome number: 2n = 24

Distribution: Kashmir

Microscopic: The transverse section of root reveals the single layer of epidermis that comprises of normal parenchymatous cells with thick outer walls. The part of the cortex typically constituting multiple layers of rectangular oval parenchymatous cells. The bulk of these cells have oil globules containing other yellowish-brown contents. It is observed that the endodermis is attached by 4-5 layers of polygonal to oval-shaped and highly thick-walled cells and that they are located in relatively compact masses. Cortical vascular bundle is absent but vascular bundles are abundant and tightly spaced in the pith between the endodermis and internal. Vascular bundles are more or less rounded on one side, tapering to the other. Every vascular bundle is composed of phloem and scattered xylem components that are covered by lignified fibrous sheath made of 1-3 layers of cells. Parenchymatous cells of pith: the cells of the pith are thin walled and oval to compact in shape.

Mahiyat(Morphology):[2,12, 13,]

This plant is called Irsa after the Greek word for rainbow because of its colored flowers, and its root is knotted and flat and smells good, which is why this type of root is traditionally used in medicine. The root smells violetly and is not of the violet plant. Makedonian sages such as Shad Forstus and Destorus praised its medicinal properties and it was used to prepare white ointments in Macedonia. The flower contains three white yellow and blue petals. Short roots, dense, reddish-yellow, and very fragrant when dry are the best. Stale or damp roots lose their strength. White roots are feeble, and the red roots are known as macaroni.

Mizaj (Temperament) : [2,12,13]

Hot 2 Dry 2

Afaal (Actions): [2,12,13]

Mulatiff (Demulcent)

Muqateh akhlat

Musaffi e Khoon (Blood Purifier)

Mufatteh e Urooq (Deobstruent)

Mukhrij e balgham (Expectorant)

Mohalil e waram (Anti-inflammatory)

Jali (Detergent)

Munaqqui(Cleanser)

Dafae hassasiyat (anti-hypersensitive)

Qabiz(Astringent)

Dafae sual (Anti-tussive)

Mudir e Haiz(Emmenagogue)

Dafae humma(Anti-pyretic)

Istemalat (Uses) :[2,9,12,13,14,15, 16,38]

It has been praised by the physicians of all times as a panacea and is broadly used in a huge number of diseases.

Dioscorides, cited by Razi, it heals up the chronic ulcers and absess, useful in insect bite, burns, vitiligo, weakness of muscles, itching and dandruf. It is emmenagogue, anti-inflammatory ,used in cold cough, pneumonia, dyspnoea.

The mucus accumulated in the chest are attenuated and resolved by Irsa ,It is also emetic and purgative.

Razi quotes Galen (199 A.D.) in his book (Al-Hawi) that it has emmenagogue, anti tussive, anti-epileptic, astringent, regenerative and anti pleuritic actions, it is useful in pneumonia, pneumothorax, eclampsia, palpitation, chill, liver pain and spermatorrhoes.29

Ibn-e-Maseehi describes the white irsa cure hot phlegmic pains of nerves and uterus, Maseeh reported its efficacy in headache, the poultice for ulcers and wounds, vitiligo itch, baldness, nerve injuries and redness of skin.

Ibne Sina recommends its efficacious actions in strengthening the wisdom and intellect, cures head injuries skull bone fractures, phlegmic and hot swelling.

Ibne Baitar quoted that it is useful in tooth ache, dyspnoea, spleenomegaly, rigidity of uterus, flatulence, it is abortifacient, anti tussive. The fomentation with Irsa is beneficial in adenitis and hard swelling.

Antaki (1597 A.D.) states its efficacy in dyspnoea, asthma, thoracic pain, hydropes, jaundice, haemorrhoids, liver complaints, and sciatica.

Dymock (1890) reported that a century back it is used in asthma, cough, fever, dyspnoea and skin diseases.

Muzir(Side Effects) : [2,12,13] For Riya (lungs)

Musleh(Corrective) :[2,12, 13] Shahed e khalis (Honey)

Badal (Substitute) :[2,12, 13] Mazriyoon hindi (Clitoria ternata linn.)

Miqdar e khurak (Dose) : [2,12,13] 5-7gram

Murakabbat (Compound formulation) :[2,6,12, 13]

Sharbat e Zoofa

Zamad e khanazeer

Arq e Chaubcheeni

Majoon e Rahul Momineen

Raughan e kalan

Table 2: PHYSICOCHEMICAL AND ORGANOLEPTIC EVALUATION:[6]

No	Parameters	Percentage (w/w)
1	**Color**	**Brownish yellow**
2	**Odour**	**Aromatic**
3	**Taste**	**Bitter**
4	**Texture**	**Wrinkled, hard and fibrous**
5	**Ash value**	
	Total ash	6.93
	Acid insoluble ash	1.03
	Water soluble ash	5.09
6	**Solubility**	
	Ethanol	6.29
	Aqueous	4.80
7	**Successive Extractive value**	
	Pet. Ether	2.9
	Di-ethyl ether	4.58
	Chloroform	2.2
	Acetone	3.45
	Alcohol	10.13
	Aqueous	14.13
8	**Moisture content**	3.46
9	**Loss on drying**	4.34
10	**PH value**	
	1% water solution	5.16
	10% water solution	5.67
11	**Bulk density**	0.67

GCMS EVALUATION:

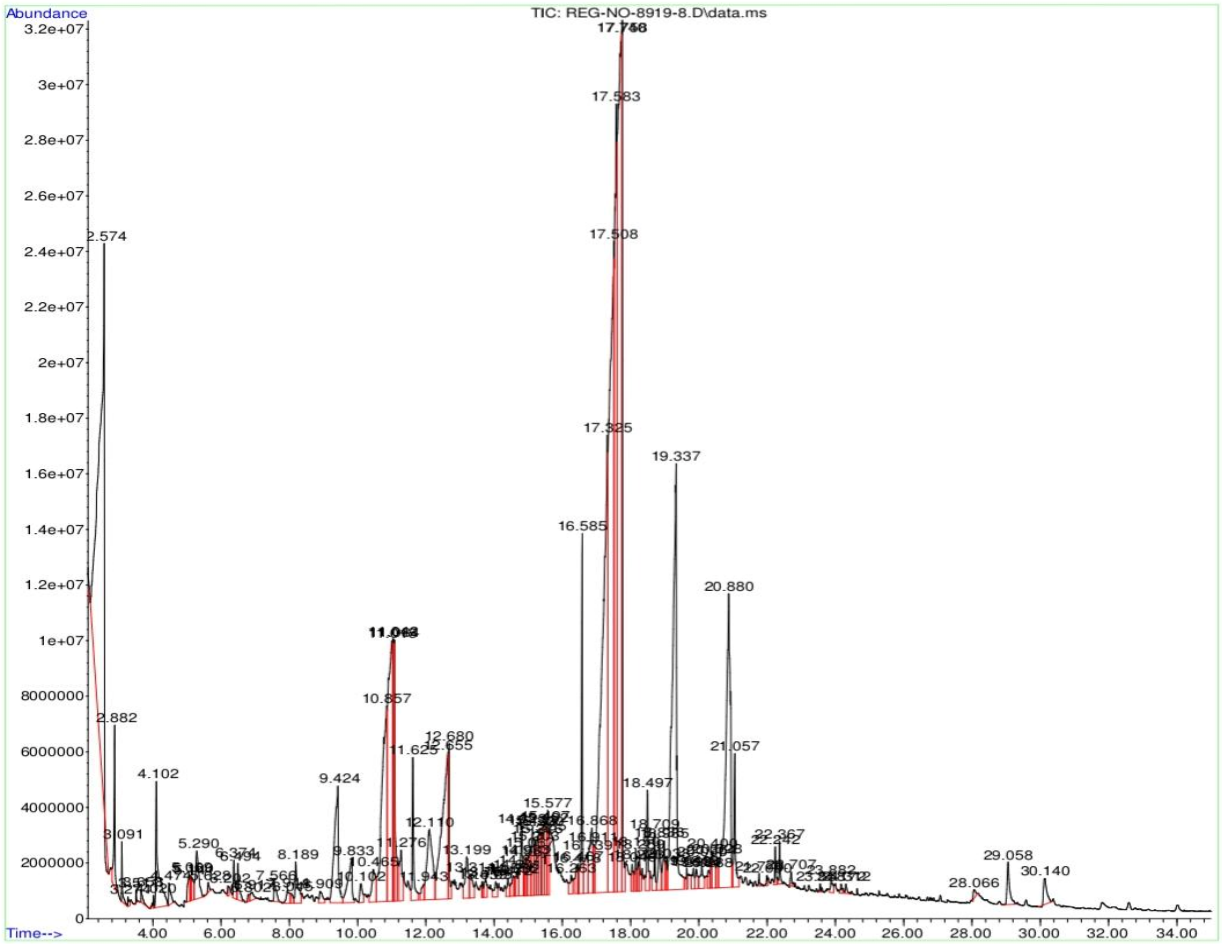

Fig 3: GC-MS Analysis: GC-MS analysis of drug was carried out at IICT-Hyderabad. And Identification of drug was done using computer search user generated reference libraries, incorporating mass spectra comparing spectral fragmentation pattern with those of published data and a library database: Wiley (Wiley Institute, USA) and NIST (National Institute of Technology, USA), and PubChem: National Institutes of Health (NIH).

Table 3: All identified compounds are mentioned below.

No	COMPOUNDS	SYNONYMS	MW	MF	Area of%	RT	PHARMACOLOGICAL ACTION
1	2,3-Butanedione	Dimethyl diketon	86.089	$C_4H_6O_2$	0.04%	3.277	Anti- microbial, muscle contraction, lowering BP, Cardioprotective effect.[17]
2	2,4-IMIDAZOLIDINEDIONE, 3-METHYL	3-Methylhydantoin	114.102	$C_4H_6N_2O_2$	0.04%	6.801	Hypolipidemic, anti-carcinogenic, antiviral,anti-microbial, anti-ulcer and anti-inflammatory.[18]
3	4H-PYRAN-4-ONE	Pyranone	144.125	$C_6H_8O_4$	1.6 %	9.425	diuretic, spasmolytic, anticancer, anti-coagulan,Antimicrobial, antifungal, anti-HIV, anti-inflammatory.[19]

4	THIOPHENE	Isopropylthiophene	126.21	C7H10S	1.02%	11.082	Anti-inflammatory, antimicrobial, and anti-cancer, anticonvulsant, anti-anxiety, anti-arrhythmic, antioxidant.[20]
5	3-Pyrrolidinol	3-Hydroxypyrrolidin	87.120	C4H9NO	1.42%	12.108	Antioxidant, Anti-inflammatory, Antibacterial, Antifungal, Antiparasitic, Anticancer. [21]
6	n-Decanoic acid	n-Capric aci	172.264	$C_{10}H_{20}O2$	0.54%	12.680	Antimicrobial and anti-inflammatory, anti- tumor. [22]
7	1H-Pyrimidine-2,4-dione	Uracil	112.086	C4H4N2O2	0.50%	16.737	antiviral, lipid metabolism, antibacterial, and anti-inflammatory. [23]
8	Tetradecanoic acid	Myristic acid	228.370	C14H28O2	8.67%	17.583	lipid anchor, myristoylation, bacterial virulence.[24]
9	Pentadecanoic acid	Palmitic acid	242.397	C15H30O2	0.20%	18.262	Cardioprotective, immune modulator, anti- cancer, hepatoprotective, anti-inflammatory. [25]
10	Palmitoleic acid	hexadec-9-enoic acid	254.408	C16H30O2	0.35%	18.985	Anti-inflammatory, improved insulin sensitivity, lipid metabolism, anti-cancer. [26]
11	n-Hexadecanoic acid	Palmitic acid	256.4241	C16H32O2	6.20%	19.340	Hypocholestroleamic, Anti-inflammatory, antioxidant, Anti-cancer,anti- diabetic, antibacterial. [27]
12	n-Octadecanoic acid	Stearic acid	284.4772	C18H36O2	0.72%	21.056	Anti-inflammatory, antioxidant, anticancer.[28]
13	Cis-Z-alpha-Bisabolene Epoxide		220.36	C15H24O	0.04%	21.767	Antioxidant and anti-inflammatory. [29]
14	Cedrol	Octahydro-3,6,8,8-tetramethyl-1H-3a,7-methanoazulen-6-ol	222.3663	C15H26O	0.04%	21.997	Antioxidant , analgesic, anti-inflammatory, antibacterial, sedative, hair growth-promoting,PAF antagonist ,anti-tumor.[30]
15	4H-chromene	4H-1-benzopyran	132.1	C9H8O	0.16%	22.365	Anticancer, antimicrobial, antiviral, anti-inflammatory, anti-coagulant, antioxidant .[31]
16	cis-Vaccenic acid	(Z)-11-Octadecenoic acid	282.461	C18H34O2	0.06%	22.707	anti-cancer, anti-inflammatory, hypocholestroleamic, lipid metabolism.[32]

17	Oleic Acid	cis-9-Octadecenoic Acid	282.4614	C18H34O2	0.06%	24.311	Reduce oxidative stress, improve insulin sensitivity, lower blood pressure, boost immunity, hypocholestroleamic, analgesic, anti- inflammatory. [33]
18	4H-1-BENZOPYRAN-4-ONE	Hispidulin	300.2629	$C_{16}H_{12}O_6$	0.07%	28.066	Anticancer, antiallergic, antitubercular, anti-inflammatory, antidiabetic, antimicrobial, antihypertensive,anti-HIV.[34]
19	Jaceosidine	5,7-Dihydroxy-2-(4-hydroxy-3-methoxyphenyl)-6-methoxy-4H-chromen-4-one	330.2889	$C_{17}H_{14}O_7$	0.38%	29.059	anti-cancer; anti-inflammatory; anti-mutagenic; antioxidant. [35]
20	Anthracene	9,10-Diphenylanthracene	330.4211	C26H18	0.38%	29.05	antioxidants, laxatives, anti-inflammatory, anti-arthritic, anti-cancer, anti-bacterial, anti-fungal, anti-diabetic, neuroprotective, immunomodulator. [36]
21	Odoricarpan	10-hydroxy, 3-4, 9-trimethoxypterocarpan	330.3	C18H18O6	0.29%	30.137	antibacterial, antioxidative, anti-inflammatory, antithrombotic, antiplatelet, antiosteoporosis antiangiogenesi. [37]

DISCUSSION:

The review beautifully correlates Unani categories deobstruent (Mufatteh-e-Sudad), expectorant (Mukhrij-e-Balgham), antiseptic (Dafii-e-Taaffun) with modern day pharmacology. The ancient functions are supported by recent research which has established significant anti-inflammatory, mucolytic, antimicrobial and bronchodilatory effects. As an example, Unani preparations such as Sharbat-e-Unsul Murakkab, clinically show a quantifiable anti-tussive and bronchial effect. These results serve to confirm conventional prescriptions of cough, asthma and catarrhal diseases.

A wide range of bioactives including flavonoids (anthocyanins, vitexin, orientin), tannins, glycosides, steroids, phenolic acids, and essential oils are recorded in numerous studies as a result of extensive phytochemical screening. This group of compounds is reported to have bioactivity: antioxidant and anti-inflammatory (anthocyanins, trinoterpenoids), antimicrobial (phenolics, essential oils), hepato- and nephro-protective effects. The phytochemical basis is robust to support a historical account of the use of the plant in therapy and future drug development.

Experimental research highlights Irsa bioactivity in a variety of areas including Antioxidant, anti-inflammatory, antimicrobial and antiviral. Antidiabetic effects- an STZ-diabetic rabbit model experienced a significant drop in blood glucose. The Unani Majoon formulations showed hepatoprotective effects on hepatitis B, and dermatological effects through topical creams/formulations on acne and psoriasis.

Until now, no large-scale clinical trials have been done, even though promising preclinical results have been obtained. The current studies done on humans are small, single-arm, or physician-reported. Good, placebo-controlled trials are clearly required to determine safety, dosing schedules, and therapeutic indices in a wide range of indications (respiratory disorders, liver protection, dermatological disorders, diabetes).

In addition, it is necessary to standardize rhizome preparations and extract profiles. The gap between traditional herbal use and regulatory-grade reproducibility is quite large: closing this with regular profiling and GMP-grade formulation may make Iris enslaved to tradition a true evidence-based herbal medicine.

Combined botanical, phytochemical and preclinical evidence supports the therapeutic potential of Iris ensata thunb.. Modern studies support the traditional wisdom of Unani medicine, although the way forward will need rigorous clinical assessment, scalable standardization and integration into formal pharmacopeia.

CONCLUSION: The deobstruent, expectorant, anti-inflammatory, antiseptic, wound-healing and emmenagogue properties of iris encompassing iris as a versatile herbal candidate, with a long and rich history of use in respiratory, inflammatory, ulcerative and skin disorders have been demonstrated. In its rhizomes and aerial portions, modern phytochemistry has found a bountiful array of bioactive content in flavonoids, isoflavonoids, phenolic acids, tannin, glycosides, steroids, terpenoids, proteins, and resins and has uncovered antioxidants such as C-glycosyl flavonoid. The antimicrobial and antioxidant activity (especially in methanolic extracts) was verified in vitro, inhibiting bacterial strains (e.g., E. coli, B. cereus), and fungi (Candida albicans, Aspergillus niger), and free-radical-scavenging activity equal to that of standard compounds.

A foundation to future quality control and formulation development has been laid down with the establishment of physico-chemical standardization parameters, including extractive values, ash, pH, moisture, and extract solubility, and confirmation of the major phytoconstituents. Nevertheless, there are still gaps in evidence: in vivo pharmacological models, toxicological profiles, pharmacokinetics, and, in particular, controlled clinical trials are still absent. At the node between the traditional Unani knowledge and the modern pharmacology stands iris ensata (Irsa). Its versatile bioactivities offer new translational studies – particularly clinical trials, standard formulation regimens and mechanistic investigations. Bringing it together with science and ancient wisdom can offer a path to achieving its potential as a proven integrative therapeutics.

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