

## Medicinal and Pharmacological Potential of Irsa (*Iris ensata* Thunb): A Comprehensive Review

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### ABSTRACT

*Iris ensata* (Irsa), a plant from the Iridaceae family, has long been a part of the Unani system of medicine, renowned for its diverse therapeutic properties. Native to regions such as the Himalayas and Southeast Asia, it thrives in temperate climates, notably in the Northwestern Himalayas of India, from Kashmir to Himachal Pradesh. Commonly referred to as "*sosan*," its varied flower colors have earned it the nickname "*Qaus-i-Qazah*" (rainbow). Traditionally, *Iris ensata* has been utilized for treating a range of conditions, from respiratory diseases like asthma and pneumonia to neurological disorders including epilepsy and tremors. The medicinal value of *Iris ensata* lies in its bioactive constituents, such as alkaloids, tannins, flavonoids, and phenolic compounds, which have demonstrated significant physiological effects. Modern pharmacological studies have confirmed the plant's cancer chemo preventive properties and its actions as an anti-inflammatory, antioxidant, antimicrobial, antiviral, anti-diabetic, and hepatoprotective agent. Despite its historical use and promising pharmacological profile, further clinical and pharmacological research is essential to validate and enhance its therapeutic applications. This review emphasizes the importance of integrating traditional knowledge with contemporary medical practices, highlighting *Iris ensata* as a valuable resource for modern healthcare. With its broad spectrum of biological activities, the plant represents a potential alternative or complementary option for treating various health conditions, particularly in regions where traditional medicine is still prevalent.

**Keywords:** *Irsa*, *Iris ensata* Thunb, Unani medicine, Flavonoids,

### INTRODUCTION

In recent times the world has witnessed increased trend in use of drugs from natural sources. The plant kingdom, however, has been used more often as compared to the two other resources such as mineral or animal origin. Plants played dominant role as they were easily available and have been in use as food and drug since the primitive man shifted from nomadic life to settled life and are still in use in traditional system of medicine in most parts of the world for maintaining and sustaining human health by taking advantage of their medicinal properties, which is evident from their tremendous historical legacy.

According to WHO the current survey suggests that many developed countries have a high proportion of the populations, making use of traditional practice of health, especially the use of various parts from medicinally important plants. Current survey suggests that 80% of the world's population depends on herbal medicine for their primary health care.<sup>1</sup> India has an age old system of medicine known as Ayurveda, Siddha and Unani system.<sup>2</sup> Unani System of medicine is one of the oldest traditional system of medicine which has strived through ages in the prevention and treatment of various medical conditions.<sup>3</sup> There is extensive change in the international interest of herbal medicines. The medicinal value of plants lies in some chemical substances that produce a definite physiological action on the human body. The most important of these bioactive constituents of plants are alkaloids, tannin, flavonoids and phenolic compounds.<sup>2</sup>

*Irsa* (*Iris ensata*) belong to the family Iridaceae, use of the drug 'Irsa' in Unani system of medicine dates back about a couple of thousands of years.<sup>4</sup> The genus comprising of about 300 species is originated in Japan and in the Mediterranean, however the species of this plant are more concentrated in the south of equator and very widely distributed throughout the North Temperate Zone. About twelve species of genus *Iris* are found all over India. Their habitats are considerably varied ranging from cold regions into the grassy slopes, meadowlands, the Middle East and northern Africa, Asia and across North America.<sup>5</sup> It is native to Nepal, Bhutan, Northeast India, Myanmar (Burma), Malaya, Sumatra, and Java. In India it is found in Temperate Northwestern Himalaya

at 1500-2700 m. and from Kashmir to Himachal Pradesh. Due to the beautiful flowers, this is often grown in gardens as an ornamental plant.<sup>6</sup>

Recently, phytochemical investigations of Iris species have resulted in the identification of various bioactive compounds belonging to different classes, including alkaloids, flavonoids and their derivatives, quinones, terpenes, steroids and simple phenolics.

Modern pharmacological studies have reported that these compounds exhibit significant effects on human health, such as cancer chemo preventive properties and anticancer, antioxidant, antiplasmodial, immunomodulatory and anti-inflammatory activities.<sup>7</sup>

**Common name-** Japanese garden iris <sup>8,9</sup>

**Synonyms<sup>8</sup>**

Iris Kaempferi

**Scientific Classification<sup>7</sup>**

Kingdom	Plantae
Subkingdom	Viridiplantae
Infrakingdom	Streptophyta
Superdivision	Embryophyta
Division	Tracheophyta
Subdivision	Spermatophytina
Class	Magnoliopsida
Superorder	Lilianaes
Order	Asparagales
Family	Iridaceae
Genus	Iris L.—Iris

**Vernacular names <sup>10,11,12,13</sup>**

English	Iris
Persian	Bekh-e-Banafsha, bekh-e-Sosan Asmanjoni
Hindi	Irsa, sosun
Kashmir	krishun, marjal unarjal
Unani /urdu	<i>Irsa</i>
Ayurvedic	Paarseeka vachaa, haimavati vachaa, pushkarmula, baal-bach
Arabic	Urooq-e-sosan
Japanese	Hanashobu
Gujarati	Paashanabheda

**Description<sup>14</sup>**

Rhizomes are creeping, thick. Leaves are linear, 30–80 cm x 0.5–1.2 cm, midvein distinct on both surfaces, apex acuminate. Flowering stems 25–100 cm, solid, 1–3-leaved; spathes 3, lanceolate, unequal, 4.5–7.5 × 0.8–1.2 cm, leathery, 2-flowered, veins distinct, raised, basal spathe shorter, apex usually acute, apical spathe longer, apex usually obtuse. Flowers dark reddish purple, 9–10 cm in diam.; pedicel 1.5–3.5 cm. Perianth tube 1.5–2 cm; outer segments obovate, mottled yellow at center, 7–8.5 x 3–3.5 cm; inner segments erect, narrowly lanceolate, 5 cm × 5–6 mm. Capsule ellipsoid, 4.5–5.5 × 1.5–1.8 cm, 6-ribbed, apex shortly beaked. Seeds are maroon-brown, semi orbicular, and flat. 2 n = 24.



Figure No.1 Irsa root



Figure No.2 Irsa flowers

### Microscopic<sup>12</sup>

The transverse section of root shows the single layer of epidermis which consists of typical parenchymatous cells with thick outer walls. The cortical region usually made up of several layers of rectangular to oval parenchymatous cells. Most of these cells possess oil globules with other yellowish-brown contents and they also give the positive test for tannins with aqueous ferric chloride. The endodermis is found to attached with 4-5 layers of highly thick-walled cells which are polygonal to oval in shape and they are present in somewhat compact masses. There is no cortical vascular bundle but vascular bundles are numerous and closely scattered in the pith internal to the endodermis. Vascular bundles are more or less roundish in shape on tapering to one side. Each vascular bundle consists of phloem and scattered xylem elements which are enclosed by lignified fibrous sheath of 1-3 layers of cells. The parenchymatous cells of pith are thin walled compact and polygonal to oval in shape.

### Irsa in unani system of medicine<sup>15,16,17</sup>

Commonly known as *Sosan* and few say as it is *jungli sosan asmani* and few *Pahadi sosan asmani*, the flower of *irsa* are yellow, dark yellow, blue, white in colour and due to diversity of colors it look like *Qaus-i-Qazah*(rainbow).

The pulp of the root is yellowish red or white. It smells like *banafsha* hence named as *bikh-e-banafsha*. It was mentioned first in *kitabul Hashaish* by Dioscorides. It is also mentioned by Theophrastus. It was particularly mentioned by Razi, Ibne Sina, Al-Hawi.

The root is hard and fibrous. The odour is pungent and taste is slightly bitter and aromatic. The best quality is small broad and thick which is difficult to break

### Mizaj (temperament)<sup>18,19,20</sup>

Hot 2 Dry 2

Hot 3 Dry 3

### Part used<sup>21,22</sup>

Root, leaves, flowers.

### Afa'al (Actions)<sup>6,11</sup>

- *Muhalhil-e-Warm* (Anti-inflammatory),
- *Mulattif* (Demulcent),
- *Mufateh-e-Sudad* (De-obstruent),
- *Munaffis-e-Balgham* (Expectorant).
- *Dafa tashannuj* (spasmodic)
- *Musakhin* (calorific)
- *Munzij*(concoctive)
- *Jali*(detergent)
- *Munaqi*
- *Mushil safra wa balgham*
- *Dafa e samoom*

- *Mudir-i- bawl*(diuretic)
- *Mudir-i-haiz* (emmenagogue)
- *Muhammir* (rubefacient)

#### **Istemat (Uses)**<sup>6,15</sup>

- *Amraz-i-balghamia* (diseases occurs due to morbidity of phlegm). e.g. *Dhāt al-Janb* (pleurisy), *Dhāt al-Ri'a* (pneumonia), *Su'āl-i-Balghami* (productive cough), and *Diq al-Nafas* (asthma).
- *Ra'sha* (tremor), *Nisyān* (amnesia), *Sar'a* (epilepsy), *Fālij* (hemiplegia), *Waja' al-Mafaṣil* (arthritis), *Trq al-Nasā* (sciatica), *Dawār* (virtigo), *Izam al-Tihāl* (splenomegaly). *Sol'a* (tumours), *Awram Salib* (hard inflammation), *Sudā'*(headache), *Ihtibās al-Tamth* (amenorrhoea), *Kalaf* (melasma), *Namash* (freckles), *Bahaq* (pityriasis alba), lentigo, *Busūr Labniya* (acne), *Busūr* (boils), *Zarba al-Shamsh* (sunburn), etc.
- It's also applied as eye salve with honey, which draw out particles or foreign body from the eye.
- A massage of Roghan Irsa (oil of Iris) prevents from rigor and chills in case of fever.
- Taken as a drink with vinegar, it helps those bitten by venomous creatures.
- It is useful for malignant ulcers; powder sprinkled over fistula promotes the growth of flesh. An application with honey also covers the bones with flesh and fills up ulcers and cleans them.
- If locally applied with vinegar and rose oil, it reduces headache.

#### **Miqdar Khorak (Dose)**<sup>6, 11,17,19</sup>

- 1-3gm
- 6-9 gm
- 3-5gm
- 5-7gm

#### **Muzir (Adverse effect)**<sup>15,19</sup>

- Lungs
- Nausea and vomiting

#### **Musleh (Corrective)**<sup>15,16</sup>

- *Tursh raboob*
- *Shehad*
- *Neelofer*

#### **Badal (Substitute)**<sup>15</sup>

- *Revand chini*
- *Mazriyoon*

#### **Compound formulation**<sup>6,15,21,22</sup>

*Aqras kundi, Aqras ward, Dawaul Khatateef , Habb-i-Maghz badam, Kalkalanaj Asghar, Lauq Batam, Qantarghan Akbar, Qantarghan Asghar, Qurs Luk; Mājun Balādur, Mājun Rahul Mominin, Mājun Laboob . Marham Khanāzīr, Marham Irsā, Roghan Balādur, Roghan Bedanjir Murakkab, Roghan Sosan, Roghan Kalan, Zimād-i-Muhasā , Roghan Alqam, Roghan Irsā, Roghan Surkhbādā, and Roghan Laqwa, sharbat zoofa, zimad -e- khanazeer, sharbat-e- istisqa warmi*

#### **Pharmacological Properties**

##### **1. Analgeic, Anti-inflammatory, Anti-microbial activities**

Irsa have been reported to possess antimicrobial activity. As it contains tannins and flavonoids which inhibit the growth of many microorganisms like bacteria, fungi, yeast etc. and relieves inflammation and also helps in inhibition of biochemical pathways related to pain or inflammation transmission.<sup>23</sup>

## 2. Anti-oxidant activity

The antioxidant activities were performed using assays viz. DPPH radical scavenging assay, Ferric ion reducing assay, FRAP assay, Hydrogen peroxide scavenging assay and Lipid per-oxidation assay. The plant shows remarkable antioxidant potential and can be used for prevention or treatment of various oxidative related diseases.<sup>24</sup>

## 3. Anti-cancer activity

Syntheses of isoflavone analogues were carried out according to in silico docking score. In-vitro screening of isolated isoflavones and its analogues were carried out for anti-cancer activity using NF-kappa B as a target and antioxidant activity. Isolated isoflavones and its analogues showed excellent interactions with NF-kappa B and established a high correlation between in silico score and in vitro anti-cancer study.<sup>25</sup>

## 4. Antiviral activity

The aqueous and ethanolic extracts of *I. sibirica* L. were evaluated against herpes simplex virus type 1. Accordingly, the rhizome ethanolic extract was the most effective on the herpes simplex virus when compared with the aqueous extract.<sup>7</sup>

## 5. Anti diabetic activity

Oral administration of *Iris ensata* Thunb root for 21 days significantly reduced blood glucose level in Streptozotocin induced diabetic rats and also in normal rats. The hypoglycaemia and anti hyperglycaemia produced by the extracts may be due to increased uptake of glucose at tissue level or increase in pancreatic  $\beta$ -cells function or due to the inhibition of intestinal absorption of glucose.<sup>26</sup>

## 6. Hepatoprotective

Non-pharmacopeial compound formulation and its hydroalcoholic extract possess significant hepatoprotective and anti-hepatitis effect against acute hepatic damage induced by CCl<sub>4</sub>.<sup>27</sup>

## 7. Neuroprotective Activity

The neuroprotective activity of *Iris* spp. has been shown to be related to the presence of flavonoid compounds, which, interestingly, prevent brain-related diseases due to their powerful antioxidant effect.<sup>7</sup>

## Conclusion

The use of *Irsa* (*Iris ensata*) in traditional systems of medicine, particularly the Unani system, underscores the rich historical legacy of plant-based therapies. Its wide-ranging therapeutic properties, including anti-inflammatory, anti-cancer, anti-diabetic, and hepatoprotective effects, highlight its potential as a valuable medicinal resource. Phytochemical investigations have identified bioactive compounds, such as alkaloids, flavonoids, and tannins, which contribute to these beneficial activities. Despite its extensive use and promising pharmacological effects, further scientific studies are required to validate and better understand the mechanisms behind its medicinal actions. As the global reliance on herbal medicine continues to grow, plants like *Iris ensata* remain crucial in maintaining health and treating various ailments, particularly in regions where traditional systems like Unani are still widely practiced.

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