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Kalam Mohd Afsahul
Research Officer (Unani) & Lecturer Department of Ilmul Advia (Pharmacology Unani), Regional Research Institute of Unani Medicine, Habak, Naseem Bagh Campus, Hazratbal, Srinagar, Jammu and Kashmir, India

Farhat Anjum
PG Scholar Department of Ilmul Advia (M.D Pharmacology Unani), Regional Research Institute of Unani Medicine, Habak, Naseem Bagh Campus, Hazratbal, Srinagar, Jammu and Kashmir, India

Corresponding Author:
Kalam Mohd Afsahul
Research Officer (Unani) & Lecturer Department of Ilmul Advia (Pharmacology Unani), Regional Research Institute of Unani Medicine, Habak, Naseem Bagh Campus, Hazratbal, Srinagar, Jammu and Kashmir, India

Suranjan (*Colchicum autumnale* L. and *merendra persica*): Great resolvent herbs of Unani system of medicine- a review

Kalam Mohd Afsahul and Farhat Anjum

Abstract
Colchicum is a Latin word given by Dioscorides. In Unani System of Medicine its corm is used by the name of Suranjan which is obtained from *Colchicum autumnale, Colchicum luteum* L. (bitter) and *Merendra persica* (sweet) from the family Liliaceae. *Colchicum luteum* L. is distinguished from sweet variety by its bitter taste, small size and reticulated appearance of corms. The plant is widely distributed over Europe and abundant in some parts of England. In India Kashmir is the paradise of medicinal herbs used in Unani and Ayurvedic System of Medicine. Many species include *Podophyllum hexandrum, Taxus baccata, Cholchicum luteum, Sausurea costus* etc. extracted from Kashmir have gain world fame due to their medicinal and aromatic values. *Colchicum luteum* L. is one of them, which is used as substitute of *Colchicum autumnale* L. and found in North Western Himalaya, commonly in Jammu and Kashmir. There are about 70 species in the Genus Colchicum and two are native to India. It is well known for its *Musakkin* (sedative) and *Muhalil* (resolvent) properties and used for the treatment of arthritis, gout and other painful diseases. These actions may be attributed due to bioactive compounds isolated from the plant, mainly alkaloids colchicine, colchicoresin, demecolcine etc. This review gives an account of the current knowledge on the morphology, phytochemistry, pharmacological action along with its uses and action in the perspective of Unani System of Medicine and modern researches.

Keywords: Suranjan talkh, *Colchicum luteum* L., *musakkin*, resolvent, Suranjan shirin

Introduction
The Unani System of Medicine (USM) is one of the oldest systems of medicine which has been introduced in Greece and later established in Rome, Spain, Iran, Arabs and India. This system is based on the teachings of Hippocrates (460-370BC), primarily on his doctrine of four humours viz. *Damm* (sanguine), *Balgham* (phlegm), *Safra* (yellow bile), and *Sawda* (black bile) with their temperamental qualities viz; hot and moist, cold and moist, hot and dry, cold and dry respectively. A large number of drugs derived from medicinal herbs in the treasure of Unani medicine make it incredible. *Suranjan* is one of the known drugs of Unani medicine. It is also called hermodactyle in Greek, which means *ASABE` Hurmus* (fingers of Hermes), it is named due to its flowers look like fingers of Hermes. The genus name is from Colchis, on the black Sea, where plant flourishes; the specific name autumnale refers to season when the plant blooms. The plant is found in Kashmir, and the flowers are first appearing in the valley on the onset of spring season as has been observed by a renowned poet of Kashmir Mahjoor in these words, "Veri-Kuem the Takeh Batney Suleh Aayeh Jay Ratney, Lag Toer Jam Zatney, Gulashan Watan Chu Sonuy" (Colchicum, you are the fair pledges of the fruitful treo, you are lovely leaves where we can know how beautiful things can be. Nature brings you forth to show your worth like sprouting of the buds surrounding you, and comfort the ailing of the people who least you see, you are the glory of flowering the land you see!) [1]. Dioscorides (1st century) named it Colchicum [2]. The flowers and corms are used medicinally for the treatment of *Waja' al-Mafasil* (arthralgia), *Niqris* (gout), *'Irq al-Nasa* (sciatica) etc. [3, 4] These effects occur due to its *Musakin-i-Alam* (analgesic), *Muhalil* (resolvent) and *Mufattih* (deobstruent) properties and hot and dry temperament which may be attributed due to the chemical constituents mainly colchicine and demo colchicine present in the corms. Two varieties are mentioned in Unani literature one is bitter variety called Suranjan Talkh (Fig. 01) which is obtained from *Colchicum autumnale* L. (meadow saffron) and *Colchicum luteum* Baker (Indian colchicum), and second is Suranjan Shirin (non-bitter) (Fig. 02) obtained from *Merendra Persica* as it is commonly found in

Persia and both are used medicinally. One more variety is black in colour, and is too much bitter and poisonous hence not used internally. First one is bitter dirty brown externally and pale yellow internally is extremely poisonous but is USM it is used medicinally by adding some *Muslehat* (correctives). Suranjan Talkh is mainly used for local application, and Suranjan Shirin is starchy dirty yellow externally and white internally, is used orally. According to Ibn Sina Suranjan is a drug of choice for *Waja' al-Mafasil* (arthralgia) in the form of Zimad [5, 6].

Some time it is adulterated with corms of sweet variety. If colchicum corm is treated with sulphuric acid (70%) or concentrated HCL, it produces yellow colour due to the presence of colchicine. Its alkaloid (colchicine) is employed in animal studies to explore wound healing and embryonic growth [4]. Though its adverse effects on the stomach and liver has prompted Unani physicians to use it cautiously.

***Mutradifat* (Vernacular Names)**

Arabic: *Akba* [5], *Suranjanul Murr, Qalbul Arz* [3]

English: Golden collyrium, Hermodactyls, Meadow saffron [7]

Hindi: Haran tutiya [4], Barbari [5]

Kashmiri: Suranjan, Virkeum, Moond [4]

Persian: Surangan [5], Gule Zangi, Shambleed [2]

Punjab: Suranjan talkh [8]

Sanskrit: Hiranya tutta, Tutham (4)

***Jae Waqu'* (distribution)**

A genus of small corm bearing herb, distributed in Europe, the Mediterranean region, Central Asia, Northern India (commonly in Jammu and Kashmir) and Himachal Pradesh at (600-2700m stem base below ground), Western temperate Himalayas, Chamba and Murree hills. A variety known as *Colchicum speciosum* Stev, commonly grows in Badghis, Khorasan, and finds its way into India [9]

Botanical Description

Colchicum autumnale L. is a perennial herb with an underground brown, scaly corm, which bears solitary, long violet and tubular crocus like flowers in the autumn (it differs from crocuses in having six not three stamens) [9]. After pollination, until spring the seed remain in the ovary when leaves appear which several, are fleshy, large, bright glossy green arranged in a rosette with the fruit and a capsule in the center. Flowers on long stalks 2.5-4.0cm in diameter, 7-10cm long whitish, red or yellow in colour. The small brown seeds are 2-3mm in diameter and are pitted. Seed is odourless. The plant is earliest one to flower after snow melts [1, 8]. Fresh corm is conical in shape, 4cm long and 3cm wide. One side of corm is convex and other side flat. At the base of corm numerous fibrous roots or their scales are present. Inner surface is fleshy and white and has fibrovascular bundles. The corm is almost odourless, with bitter and acrid taste [10]

Taxonomical classification

Kingdom: Plantae

Subkingdom: Viridiplantae

Infrakingdom: Streptophyta

Super division: Embryophyta

Division: Tracheophyta

Class: Magnoliopsida

Superorder: Lilianae

Order: Liliales

Family: Colchicaceae

Genus: Colchicum

Species: *Colchicum autumnale* L.

Cultivation and collection

Fresh seeds are sown which germinate up to 30%. In August, September 2-6 flowers bloom which are identical to Saffron and has pale purple colour. More than half the length of the flower is below the ground. Leaves and capsular fruit are produced in the next spring. The fruit is three lobbed, three celled, and septicidal capsule. On expansion of leaves in the spring the fruit comes out the ground, collected in July or August before its dehiscence. Before flowering corms are dug out for medicinal use, their outer membranous scales are removed, cut in transverse or longitudinal places and dried up to 65 degree centigrade [10].

Description in Unani Literatures

According to Unani descriptions Suranjan is root of a perennial herb whose flowers are white, red and yellow in colour. The plant is earliest one to bloom after snow melts. At the base of corm numerous fibrous roots on their scales are present. According to Hakim Azam Khan Suranjan is of 3 types by the colour of external and internal surface [3];

Type 1: Root of herb is white in colour and sweet in taste.

Type 2: Root of herb is blackish red.

Type 3: Root of herb is slightly blackish and bitter.

The red and black varieties are poisonous [11]

Jalinoos (Galen 131 AD) has mentioned *Suranjan*, a highly toxic drug [3]

***Ajza-i- Mustafa'mla* (parts used)**

Its corm (*Suranjan*) and flowers (*ASABE' Hurmus*) are used for medicinal purpose [11].

***Mizaj* (Temperament)**

Hot and dry in 3rd degree (Suranjan Talkh); Hot and dry in 2nd degree (Suranjan Shirin) [12].

***Af'al* (actions)**

Suranjan has been used for its *Musakkin* (sedative), *Muhallil* (resolvent), *Mufattih Sudad* (deobstruent), *Mundij* (concoctive), *Mu'addilul Qiwam* (alternative), *Jali* (detergent), *Munawwar* (somniferous), *Mushil-i-Balgham*

*(*phlegomague*)*, *Muqwwi-i-Bah* (aphrodisiac), *Mudirr-i-Bawl* (diuretic), Purgative [2, 3, 6, 11, 12]
According to various modern literatures its ethanomedicinal properties mentioned are as emetic, cathartic, antichemotatic, antiphylogistic, inhibitor of mitosis [7]. Dried corms are carminative, laxative, and aphrodisiac [4]. With ginger and pepper it is used as an aphrodisiac [9]. Extracted colchicine is employed orally in tablet form for arthritis and familial Mediterranean fever [4]. Dried juice is applied in ophthalmia [8].

***Istemalat* (therapeutic uses)**
Mainly the Suranjan is used to cure *Waja' al-Mafasil* (arthralgia), *Niqris* (gout), *'Irq al-Nasa* (sciatica), *Bawasir* (haemorrhoids), *Suda' Barid* (headache due to cold), *Du'f al-Bah* (sexual weakness), *Amrad A'sab* (nerve disorders), skeletal pain and *Juruh* (wound). These uses are attributed due to deobstruent, anti-inflammatory, analgesic, phlegmagogue and diuretic effects [2, 3, 6, 11].

***Tarkeeb Iste'mal* (mode of administration)**
Suranjan Talkh is applied locally in form of oil and paste and generally avoided through oral route but Suranjan Shirin is commonly used orally and included in various compounds as main ingredient. The mode of administration of drug is as follows;

Inflammations: Along with Zafran (*Crocus sativus* L.) its paste is applied to resolve inflammatory and painful conditions [2, 3].
With *Roghan-i-gul* (rose oil) it is applied locally for the treatment of inflammatory and painful conditions of joints such as *Waja' al-Mafasil* (arthralgia), *Niqris* (gout), *'Irq al Nasa* (sciatica) etc. but causes hardness in joints if used for long duration [2].
Gout: Its powder mixed with aloe is used to cure *Niqris* (gout). Its flower is smelled to cure obstruction in brain, coldness of brain, gaseous matter in brain, headache due to cold, and nasal obstruction [2].

Impotence: For aphrodisiac purpose the powder of its flower is taken along with Zeera (*Carum carvi* Linn), Podina (*Mentha arvensis* Linne) and Sonth (*Zingiber Officinale* Roscoe). Due to presence of *Rutubat Fazlia* its corm is also used with milk and sugar for the same purpose [2, 3]

Haemorrhoids: A suppository made with its powder in goat's fat is put into anus, it gives immense response in painful piles [2].

Nerve disorders: It is useful for nerves when taken along with Mastagi (*Pistacia lentiscus* L) [2].

Skeletal Pain: A plaster of Suranjan Talkh (*Colchicum luteum* Baker) made with Zafran (*Crocus sativus* L.), Phitkari (Alum) and egg white is applied locally to remove bone pain [2].

Wound: Due to its *Muzaffar* (siccative) property the powder of dried corn is sprinkled on wounds to promote healing [2].

***Miqdar Khurak* (dosage)**
It depends upon various factors like age, health etc. the approximate dose is 2-3 Masha (1*Masha*=approx. 1gm) (Suranjan Shirin) (12); 1-3 Ratti (1*ratti*=approx. 125gm) (125-375mg) (Suranjan Talkh) [12]

***Mazarrat* (toxicity, adverse effects and contra-indications)**
Colchicine frequently causes nausea, vomiting and abdominal pain [8]. Large doses may cause profuse diarrhea, gastrointestinal haemorrhage, muscle weakness, renal and hepatic damage, skin hypersensitivity, and hypotension [8]. Its use is contraindicated in pregnancy. Its use for longer period is not recommended due to its depressant action upon central nervous system. It is known to produce neuropathy, myopathy, alopecia, peripheral neuritis, bone marrow depression with agranulocytosis and aplastic anemia may occur [8]. Autumn crocus contain Colchicine. Taking autumn crocus along with colchicum might increase the effect and side effects of colchicine.

***Musleh* (correctives)**
Zanjabeel (*Zingiber officinale* Roseoe) and Filfil Seyah (*Piper nigrum* L.) are used as correctives for the toxicity of Suranjan Talkh. Katira (*Sterculia urens* Roxburgh) and Zafran (*Crocus sativus* L.) are used for the correction of toxicity of Suranjan Shirin [12].

Badal (alternatives or substitute)
Asgand (*Withania somnifera* Dunal), [2] Turbud (*Ipomea turpethum* L.), One third of Aftimoon (*Cascula reflexa* Roxb.), Buzidan (*Polygala senega* Linn.); In case of arthralgia and gout the substitute is Hina (*Lawsonia alba* Lamarck) [3].

***Murakkabat* (compound formulations)**
Majun Suranjan, Habb-i Suranjan, Roghan waja-ul- Mufasil, Safoof Suranjan, Roghn Suranjan, Safoof Suranjan Zafrani (see detail in table no. 01)

Scientific Studies
Phytochemistry
Colchicum contain the alkaloids mainly colchicine (0.3-0.8%), colchicoresin, demo colchicine, starch. Other alkaloids include lumicolchicine, 3-demethylcolchicine, N-formyl desacetyl colchicine, 3-demethyl–N–desacetyl-N for mylocolchicine and kesselringine. Colchicine is an amorphous, yellowish white alkaloid, readily soluble in water, alcohol or chloroform. On exposure to UV light, colchicine is changed to lumicolchicine [13].

Pharmacological studies
The plant is proved for anti-fibrotic, anticancer activities [14]. Colchicine binds to tubulin, the protein subunit of microtubules. It's most important biological effect is the inhibition of processes that depend on microtubule function by blocking polymerization. In preventing microtubule formation, colchicine has been shown to inhibit catecholamine secretion from adrenal medulla, iodine secretion from thyroid gland and prolactin secretion from pituitary tumour cells. It inhibits stimulated insulin secretion from isolated perfused pancreas and islets *in vitro* [7].

A clinical case study has been done by Aysha *et al.* (2019) [15], in which *Habb-i-Suranjan*, a compound formulation in the form of pills, having *Colchicum luteum* as one of the main ingredient has been investigated along with regimenal therapy (hot and moist fomentation applied locally) with some anti-inflammatory herbs in case of knee osteo-arthritis. In the study it was found that *Habb-i-Suranjan* (pills) taken orally, and regimenal therapy applied locally, is quit safe and effective to cure osteoarthritis [15].

Conclusion

Colchicum corm has been used in Unani System of Medicine since long period of time for the treatment of arthralgia, gout, sciatica etc. Pharmacological studies have proved its efficacy in various ailments as claimed by Unani Physicians in the past, such as resolvent, deobstruent, sedative, aphrodisiac, phlegmagogue etc. but several activities are required to prove scientifically. Though its high toxicity has prompted Unani Physicians to use it judiciously, still it is an important herbal medicine in Unani System of Medicine.

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Table 1: Showing compound formulations of Suranjan and their forms, dosage and indications

S.N	Name of Compound formulation and their forms	Type of Suranjan used	Dose and methods of administration/application	Indications
1.	Aujaia (capsule form)	Suranjan Shirin (*Merendra persica*)	Two tablets twice a day with lukewarm water/ orally	Arithralgia, Arthritis, Sciatica, [16]
2.	Habb-i-Irqun Nisa (Pills form)	Suranjan Shirin (*Merendra persica*)	400 mg with lukewarm water twice a day/ orally	Arthralgia, Sciatica, Neuralgia [16]
3.	Habb-i-Mafasil (Pills form)	Suranjan Shirin (*Merendra persica*)	3-5 gm orally	Arithralgia, arthritis [8]
4.	Habb-i-Suranjan (Pills form)	Suranjan Shirin (*Merendra persica*)	Three pills (each 120mg.) twice or thrice a day.	Arithralgia, sciatica [11]
5.	Lubub-i-Barid (Majun form)	Suranjan Shirin (*Merendra persica*)	10 gm, orally	Aphrodisiac [17]
6.	Labub-i-Kabir Khas (Majun form)	Suranjan Shirin (*Merendra persica*)	6 g with 60 ml Maullaham Khas or milk once a day	Sexual weakness, General weakness, Weakness of nerve, weakness of heart, weakness of brain, weakness of kidney, weakness of urinary bladder, *Qillat-i-Mani, Riqqat-e-Mani* [16]
7.	Majun Chob Chini Ba Nuskha Kalan (Majun form)	Suranjan Shirin (*Merendra persica*)	5gm orally	Arthralgia, rheumatoid arthritis, sexual weakness, stomach weakness, ring worm [18].
8.	Majun Murawwah al Arwah (Majun form)	Suranjan Shirin (*Merendra persica*)	1 gm with Maul-Laham do Aatsha (60 ml) or milk (250 ml).	Sexual weakness and Weakness of vital organs [18]
9.	Majun Niqris (Majun form)	Suranjan Shirin (*Merendra persica*)	5gm orally	Sciatica [18]
10.	Majun Suranjan (Majun form)	Suranjan Shirin (*Merendra persica*)	7gm with milk or water/ orally	Arithrits, gout, sciatica, nerve disorders
11.	Majun Yahya Bin Khalid (Majun form)	Suranjan Shirin (*Merendra persica*)	5gm orally	Sciatica, arthralgia [18]
12.	Majun Khadar (Majun form)	Suranjan Shirin (*Merendra persica*)	5g twice a day	Anaesthesia, numbness [17]
13.	Majun Sheer Bargad wali (Majun form)	Suranjan Shirin (*Merendra persica*)	5g twice a day	Semenogenic [17]
14.	Qurs Iksir Falij wa Laqwa (Tablet form)	Suranjan Shirin (*Merendra persica*)	One tablet (520 mg) twice a day	Hemiplagia, bell's palsy [18]
15.	Roghan Gul Akh (Oil)	Suranjan Talakh (*Colchicum luteum* Baker)	Local application	Used as polutue for gout and rheumatic pains, lumbago [17]
16.	Roghn Suranjan (oil)	Suranjan Talkh (*Colchicum luteum* Baker)	Local application	Muscle pain, Sciatica, gout
17.	Roghan Waja' al-Mufasil (oil)	Suranjan Talkh (*Colchicum luteum* Baker)	Local application	Arthralgia
18.	Safoof Suranjan (Powder)	Suranjan Shirin (*Merendra persica*)	6 g twice a day with lukewarm water	Antiarthritic, gout [16]
19.	Safoof Suranjan Zafrani (Powder)	Suranjan Shirin (*Merendra persica*)	3-5gm, orally	Arthralgia, sciatica, gout etc.
20.	Shababi (Majun form)	Suranjan Shirin (*Merendra persica*)	6 g twice a day	General weakness, Neuralgia, sexual weakness [16]
21	Ushban (Majun form)	Suranjan Shirin (*Merendra persica*)	6 g twice a day	Syphilis, leprosy, arthralgia, impurity of blood, pruritus, acne, boils, skin diseases [16]

[3, 19, 20]

Fig 1: Showing fresh herb of Colchicum luteum (a.), (b.), (c.); Suranjan Talkh (d.); and Suranjan Shirin (e.)

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