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Editorial Office
National Environmental Science Academy
206 Raj Tower - I
Alaknanda Comm. Centre,
New Delhi - 110 019

Incharge-Publication
Gian Chand Kashyap
nesapublications@gmail.com

Incharge Administration
Rakesh K. Roy
infonesa88@gmail.com

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PHARMACOGNOSTICAL STUDY OF *JAR-UL-NAHR* (*POTAMOGETON NATANS* LINN.) (WHOLE PLANT) FOUND IN DAL-LAKE KASHMIR

Iqra Rifat[1], Mohd. Afsahul Kalam[2], Suheena Khanday*[3], Aamir Yousuf[4] and Sajad Salim[5]

[1]JRF (Pharmacovigilance), Regional Research Institute of Unani Medicine, Srinagar-110006, J&K
[2]Research Officer (U), Regional Research Institute of Unani Medicine, Srinagar-110006, J&K
[3]Research Officer (U), Central Council for Research in Unani Medicine, New Delhi-110058
[4]SRF (U), Regional Research Institute of Unani Medicine, Srinagar-110006, J&K
[5]Professor, Kashmir Tibbiya College, Shilwat-193501, Jammu & Kashmir

Research Paper

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ABSTRACT

Recently, the plant-derived substances have become of great interest due to their versatile applications. Medicinal plants are the richest source of drugs of traditional systems of medicine, modern medicines, folk medicines, pharmaceutical intermediates and chemical entities for synthetic drugs. The medicinal value of these plants is due to the presence of bioactive phytochemical constituents that produce specific physiological effects on human body. Since time immemorial plant products have been part of phytomedicines that can be derived from any part of the plant like bark, leaves, flowers, seeds, etc i.e., any part of the plant may contain active components. Knowledge of the chemical constituents of plants is of great importance because such information will be of value for the synthesis of complex chemical substances. This study is aimed to evaluate the physicochemical, macroscopic, microscopic and preliminary phytochemical studies of the whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn), belonging to the Potamogetonaceae family. Potamogeton natans, commonly referred to as Floating Pondweed, is a submerged aquatic plant with potential applications in various fields, including medicine. This is a very common pondweed. Large oval floating leaves are softly heart-shaped at base. The plant possesses many important phyto-chemicals like sesquiterpenes, phenolic compounds, essential oils, etc. The plant has anti-inflammatory, antioxidant, antifungal, antitumor, antiseptic, spasmolytic and hemostatic properties. As there is no detailed standardization work reported on whole part of *Potamogeton natans* L., the objective of this study was to work out the physicochemical parameters, macroscopic and microscopic study and preliminary phytochemical constants. The study revealed specific identities for the crude drug which will be useful in identification and to check the adulteration of the raw drug.

No. of Pages: 13 **No. of Fig: 9** **No. of Tables: 10** **References: 23**

Keywords: Styptic, haemostatic, *jar ul nahr,* coagulant.

INTRODUCTION

In todays' era traditional medicines are getting more response and demand day by day, due to the less side effect, cost effectiveness, better efficacy and good faith of society in herbal medicine and their products when compared to the toxicity and

*Corresponding author: suhinakhanday@gmail.com

adverse effects which usually occur due to the allopathic drugs.(Yadav 2008). About 30% of prescribed medicines are prepared directly or indirectly from plants worldwide. (Vimalavady 2012, Anwar 1979,Yadav 2008). Unani system of Medicine, one of the oldest traditional systems has been serving mankind from centuries by alleviating ailments through drugs derived from natural resources like plants, minerals and animals. However, the plant kingdom has been used more often as compared to two other sources. Practically all types of plants have been used for medicinal purposes that include shrubs, herbs, creepers, climbers and even aquatic plants but researchers have given less attention towards aquatic plants (hydrophytes). The pondweed family, Potamogetonaceae, comprises 110 species that are sectioned over six genera with *Potamogeton* as the largest genus (Les D.H. 1990). Several plants from the genus have been utilized in folk medicine. (Les D.H, Shirshova T.I 2012). For instance, in China, *P. natans* L. is utilized in the treatment of the inflammation of the eye lining and in a combination with *P. perfoliatus* L. to cure some skin conditions. Infusions of the leaves of *P. natans* are utilized for stomach cramps and diarrhea, as well as for an antiscorbutic and for wound healing in Arabic medicine (Bhowmik S 2013). In Unani System of Medicine, *Potamogeton natans* Linn which is an aquatic plant, is known by *Jar-ul-Nahr* and is described by various scholars like *Ibn Sīnā* , Ghani, *Ibn Baytār*, Kabiruddin etc. for its haemostatic property, but nowadays this drug is lesser known and under exposed among Unani physicians due to its non-availability or limited accessibility or lack of identification. As this plant is available in various lakes in Kashmir, so its need of an hour to re-introduce the drug and to carry out various pharmacological studies as mentioned in *Unani Tibb*.

Plant material collection

A survey tour to Dal Lake was conducted in December 2021 to collect plant specimen for future reference and making the herbarium for the authentication of plant. The voucher specimen was deposited in the herbarium of survey of Medicinal Plants Unit (SMPU), RRIUM, Srinagar under voucher specimen no.5866-5869. For the collection of flowers another survey tour was conducted in month of august 2022. The collection was done in the same area of Dal Lake where it was done before. The plant was authenticated by Dr. Akhter H. Malik KASH, and submitted in the museum of Centre for Biodiversity and Taxonomy (CBT), University of Kashmir under specimen voucher No.8040.

Physico-Chemical Evaluation

The air dried coarse powdered aerial part of *Jar-ul-nahr* (*Potamogeton Natans* L) was subjected to undergo certain physical and chemical processes to estimate the ash values (total ash, water soluble ash, acid insoluble ash); extractive values (water soluble extractive value, alcohol soluble extractive value) and also moisture content (loss on drying). The procedures were followed as per Indian pharmacopeia, 1996. All the calculated values are presented in Table no.01.

Macroscopical and sensory evaluation:

The detailed macroscopic evaluation is necessary to differentiate between the related species having similar appearance (Anonymous, 1998). The macroscopic evaluation involved the detailed study of the visual appearance and sensory profile of the crude drug sample. The sample of plant was examined by naked eye and other sensory organs for the shape, size, colour, odour, taste, and other external features of the stem, leaves and flowers of *Jar-ul-Nahr* (*Potamogeton natans* L) were evaluated for its size, colour, shape odour, consistency through the naked eyes. (Table 02 Fig 1).

Microscopical evaluation

The whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn) were powdered and sliced and then boiled in chloral hydrate solutions for few minutes. A little quantity of powder was taken onto a microscopic slide, evenly spread with the help of brush, stained with phloroglucinol solution and a drop of concentrated HCL, then few drops of glycerine (10%) was added to it. The

slides were covered with a cover slip and observed under microscope for various microscopic characters. (Radhika 2010) (Fig 2).

a) Powder study

The Whole plant of *Jar-ul-nahr* (*Potamogeton Natans* Linn) were powdered separately and both stained and unstained slides were prepared. These slides were then observed under microscope. Fig 3 shows the powder microscopy of *Jar-ul-Nahr* (whole plant) *Potamogeton Natans* L. showing), a. Prismatic calcium oxalate, b. Non lignified isodiametric cells, c. Mesocarp, d. Reticulated vessels (d1), Pitted vessels (d2), e. Thick wall epidermal cells.

b) Transverse section

For microscopic evaluation, free hand sections of the fresh stem, root and leaf of *Jar-ul-Nahr Potamogeton Natans* L. were then cut and cleared with chloral hydrate solution and water. Both stained and unstained sections were prepared. Sections were stained with phloroglucinol and hydrochloric acid in the ratio of 1:1 (Tylor et al, 1981, Brain et al, 1975) Fig 04, 05 and 06 show stained slides of transverse section of stem root and leaf respectively of the plant.

Extraction of crude drug material:

The whole part of the plant of *Jar-ul-Nahr* (*Potamogeton natans* L**)** was collected, cleaned and dried under shade at room temperature. The dried whole plant was pulverized using stainless steel mixer grinder. After pulverization, the powder was stored in dried and air tight glass containers for the phytochemical investigation. 600g dried coarsely powdered material of whole plant of *Jar-ul-Nahr* was subjected to successive extraction in soxhlet apparatus. Soxhlation was performed at 60^0c using Petroleum ether (40/60) as non-polar solvent at first. Exhausted material was dried and afterward extracted with Ethylacetate, Methanol and Hydro-alcoholic in increasing order of polarity. In each solvent, Soxhlation was continued until no color was observed in siphon tube and evaporated for residue. Absence of residual confirmed the completion of extraction. The extracts were evaporated until they were completely dry, and their extractive values were calculated. (Chaudhari 1996).

Preliminary Phytochemical investigation of the extracts:

- The petroleum Ether, ethyl acetate, Methanol and Hydro alcoholic extract of whole plant of *Jar-ul-Nahr* were subjected to phytochemical screening to identify constituents like alkaloids, glycosides, tannins, phenols, carbohydrates, flavonoids, Proteins, Saponins and Sterols present in the plant. Table 03. (Gokhale SB 1994, Harborne JB 1995, Shanmugam S 1990, Anonymous. 1998, Pawar 2014).

Thin layer chromatography (TLC)

Jar-ul-nahr (*Potamogeton natans* L) was subjected to TLC profiling. Suitable solvent system was developed to act as mobile phase for these extract solutions. For Pet ether extract of *Jar-ul-nahr (Potamogeton natans* L), the solvent system developed was Petroleum Benzene and Ethylacetate in the ratio of 8:2. For Ethyl acetate extract of the plant, 2 solvent systems were used as Petroleum ether and Ethylacetate in the ratio of4.5:5.5 and Petroleum benzene: Ethylacetae in the ratio of 7:3 that was developed was 25% ethyl acetate in 75% of Pet ether. For Methanolic extracts of *Jar-ul-nahr* (*Potamogeton natans* L) the solvent system developed was Toluene: Ethylacetate: Formicacid: Methanol (1:7:2:1).The retention factor (Rf) values were correspondingly calculated and showed in the Table no. 04.

Results:

Table 1: Physicochemical Standard of different extractive values of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.).

Sl. No	PARAMETERS	VALUE
1.	**Ash value**	
	Total ash value	9.4%
	Water soluble ash value	1.6%
	Acid insoluble ash value	5%
2.	**Loss on drying**	8.8%
3.	**Extractive values**	
	Pet Ether	0.64%
	Ethyl acetate	0.68%
	Methanol	1.86%
	Hydro alcohol	4.2%
4.	**Hot extractive value**	
	Ethanol	5
	Aqueous	15.2
5.	**Cold Extractive value**	
	Ethanol	4.2
	Aqueous	9.6

Table 2: Macroscopic characteristics of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn).

Plant Part	Odour	Colour	Taste	Shape
Stem	Fishy when fresh. On drying smells characteristic	Dark green, leathery opaque with translucent longitudinal veins.	Tasteless in beginning and astringent later	Cylindrical, without many branches, and grows from 1 to 2 meters
Leaves	Fishy when fresh. On drying smells characteristic.	Green coloured in early stage and later dark brown coloured.	Tasteless	4-11 x 2- 4.5 (Length x width) Both submerged and floating more or less spirally arranged. Floating leaves are firm, oval-elliptic to egg shaped with 17-37 veins flanking mid-rib.
Flower	Fishy when fresh. On drying smells characteristic.	Green colour in early stage and dull yellow in later stage.	Tasteless	Flower spikes are dense and cylindrical, 5 – 10 cm long pointed at tip rounded at base. Flowers from May to September.

Fig 1: A Image of Potamogeton natans in natural source, b. When taken out of water, c. After multiple washing and d. Herbarium.

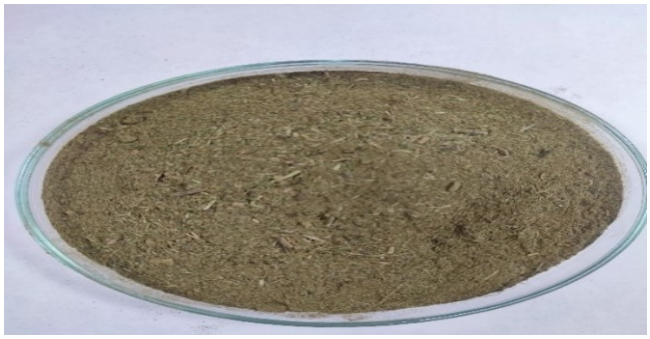

Fig 2: Powder form of Jar-ul-Nahr (Whole Plant)

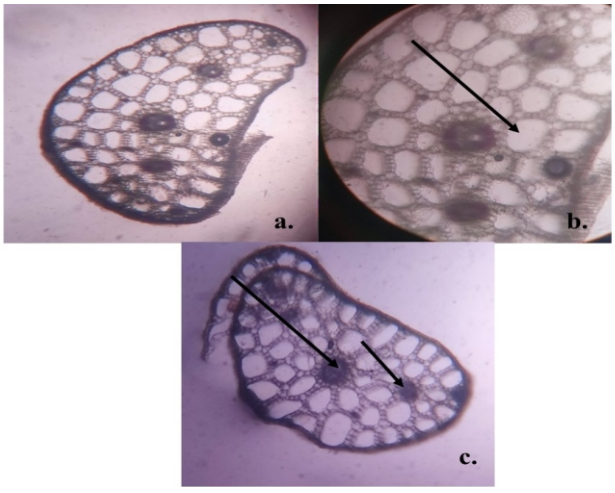

Fig 2: Transverse section of stem a. Showing epidermis with chloroplast, b. Showing aerenchyma and and c. Shows vascular bundles.

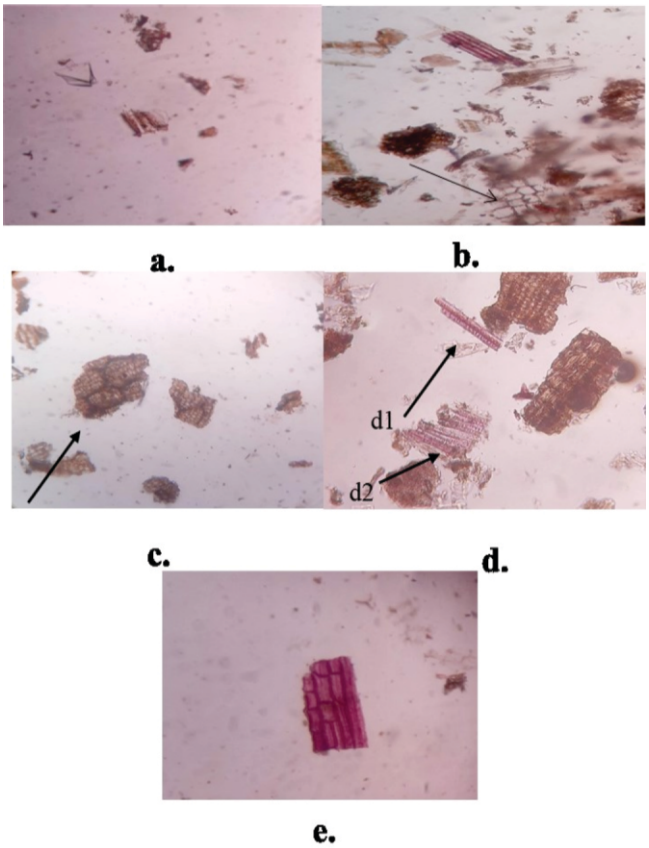

Fig.3: Powder microscopy of Jar-ul-Nahr (whole plant), a. Prismatic calcium oxalate, b. Non lignified isodiametric cells, c. Mesocarp, d. Reticulated vessels (d1), Pitted vessels (d2), e. Thick wall epidermal cells.

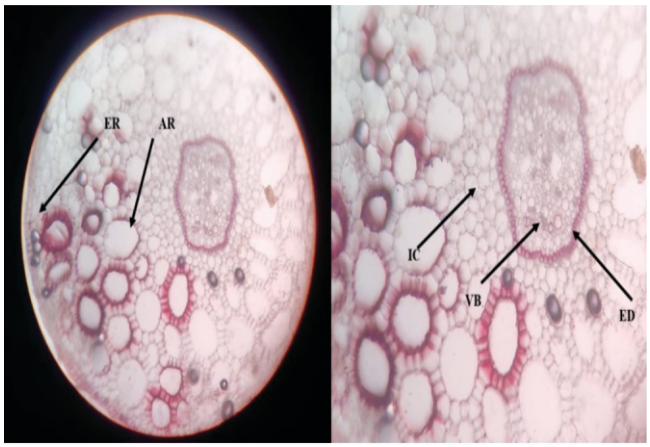

Fig. 5: Transverses section of root showing epidermis (ER), Aerenchyma (AR), Inner cortex (IC), Single layer endodermis (ED) and vascular bundle (VB).

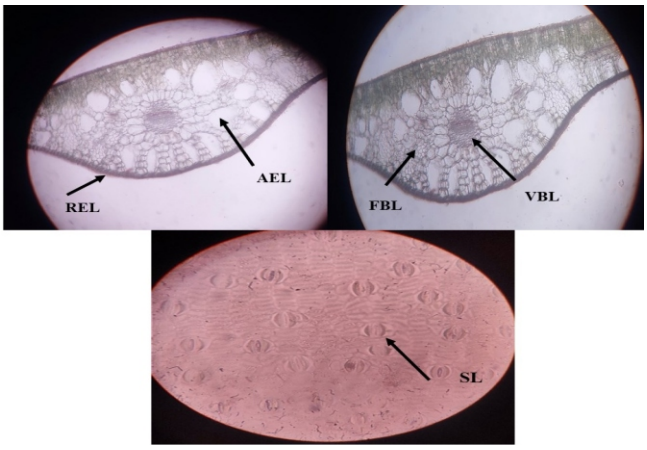

Fig. 6: Transverse section of leaf showing rectangular epidermis (REL), Aerenchyma (AEL), Vascular bundle (VBL), Fibre bundle (FBL) and SL showing stomata that are present on upper surface of leaf and are absent on lower surface.

Table 3: Phytochemical screening of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.).

S.No	TESTS	Petroleum ether	Ethyl acetate	Methanolic	Hydro alcoholic
1.	**CARBOHYDRATES**				
A	Molisich's test	-	-	+	+
b.	Fehling's test	-	-	-	+
c.	Benedict's test	-	-	-	+
2.	**TANNINS**				
a.	5%FeCl3	-	+	-	+
b.	Lead acetate	-	-	-	+
3.	**FLAVONOIDS**				
a.	Shinoda test	-	-	+	+
4	**PHENOLICS**				
a.	1%FeCl3	_	_	+	+
5.	**ANTHRAQUINONE GLYCOSIDES**				
a.	Borntrager's test	-	-	+	+
6.	**CARDIAC GLYCOSIDES**				
a.	Keller killiani Test	-	+	+	+
b.	Legal test	-	-	-	-
7.	**TERPENOIDS**				
a.	Salkowski's test	+	-	-	-
8.	**PHYTOSTEROLS**				
a.	Libermann's test	+	+	-	-
b.	Salkowski test	+	-	-	-
9.	**ALKALOIDS**				
a.	Dragendroff's reagent	-	-	-	-
b.	Mayer's reagent	-	+	-	-
C	Wagers test	-	+	-	+
d.	Hagers test	-	-	-	-
10.	**PROTEINS**				
a.	Millon's test	-	+	+	-
b.	Biuret test	-	-	-	-

Table 04: TLC profile of different extracts of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.) along with R_f values.

Extracts	Solvent system	No. of spots	Rf values
Ethyl acetate	Petroleum ether: Ethylacetate (4.5:5.5)	4	0.71; 0.76; 0.82;0.91,
	Petroleum Benzene: Ethyl acetate (7:3)	4	0.15; 0.49; 0.62; 0.90
Methanol	Toluene: Ethylacetate: Formicacid: Methanol (1:7:2:1)	3	0.14; 0.31;0.75
Petroleum ether	Petroleum Benzene: Ethyl acetate (8:2)	8	0.09; 0.19; 0.24; 0.29; 0.31; 0.41; 0.58; 0.92

Table 05 : pH values of whole plant of Jar-ul-Nahr (*Potamogeton natans* L.)

pH values		
Sample	**pH**	**Temp**
pH of 1 % solution	5.5	20^0C
pH of 10 % solution	5.6	20^0C

Table 06 :: Powdered drug reaction with different chemical reagents of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.)

Treatments	Observations
Picric acid	Light Green
Conc. Hcl	Green
Conc.H_2SO_4	Dark Green
Conc.HNO_3	Light Brown
Iodine solution	Brown
Ferric chloride	Green

Table 07: Swelling index of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.)

Swelling index		
Part used		**Swelling index**
Whole plant		Nil

Table 08: Foaming index of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.)

Foaming index		
Part used		**Foaming index**
Whole plant		Nil

Table 9: Determination of Heavy metals of whole plant of *Jar-ul-Nahr*.

S. No.	Parameters	Results	Permissible limits as per ASU Pharmacopoeia's	Inference
1.	Lead	0.0000 mg/L	10 ppm	Within the permissible limits
2.	Cadmium	0.0137 mg/L	0.3 ppm	Within the permissible limits
3.	Mercury	0.8535 mg/L	1.0 ppm	Within the permissible limits

Table 10: Fluorescence Analysis of whole plant of Jar-ul-Nahr (*Potamogeton natans* L.)

Sl. No.	Treatment	Day Light	UV(254nm)	UV(366n)
1.	Powder as such	Green	Green	Green
2.	Powder treated with distilled water	Green	Dark Green	Black
3.	Powder treated with GAA	Golden	Dark Green	Light Red
4.	Powder treated with conc. HCl	Green	Dark Green	Dark Brown
5.	Powder treated with conc. HCl + H_20	Golden	Light Green	Black
6.	Powder treated with Pet. Ether	Light Green	Light Green	Light Green
7.	Powder treated with 5% Iodine	Brown	Green	Black
8.	Powder treated with methanol	Greenish	Greenish	Dark Orange
9.	Powder treated with ethylacetate	Light Green	Green	Orange
10.	Powder treated with conc. H^2SO^4	Dark Green	Dark Green	Parrot Green
11.	Powder treated with conc. H_2SO_4 +H_2O	Brown	Green	Black
12.	Powder treated with picric acid	Light Green	Dark Green	Black
13.	Powder treated with 5% $FeCl_3$	Green	Dark Green	Black
14.	Powder treated with chloroform	Brownish	Light Green	Black
15.	Powder treated with HNO_3	Light Brown	Olive Green	Black
16.	Powder treated with HNO_3+H_2O	Brown	Green	Black
17.	Powder treated with Acetone	Greenish	Greenish	Orange
18.	Powder treated with Benzene	Light Green	Light Green	Light Green
19.	Powder treated with ccl4	Green	Dark Green	Black

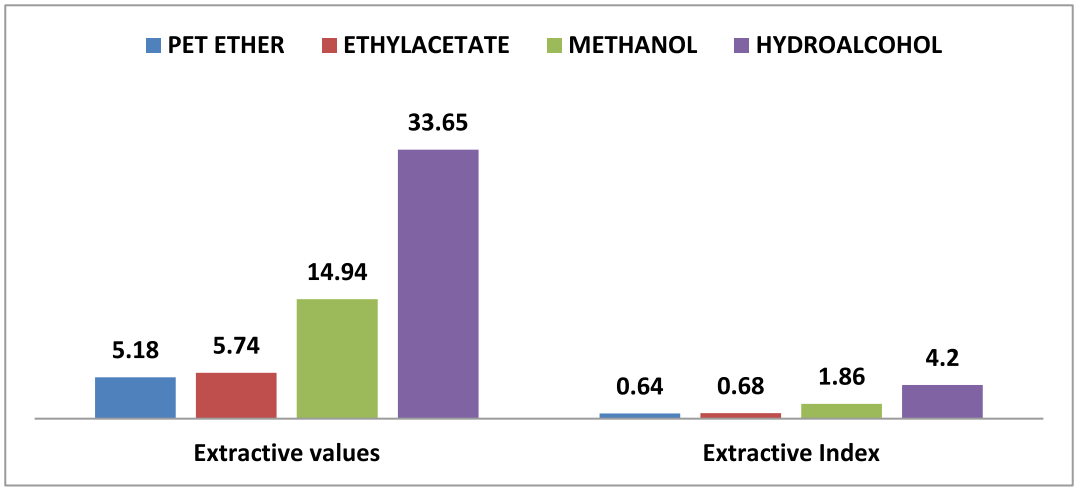

Fig. 7: Comparative extractive values of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L.)

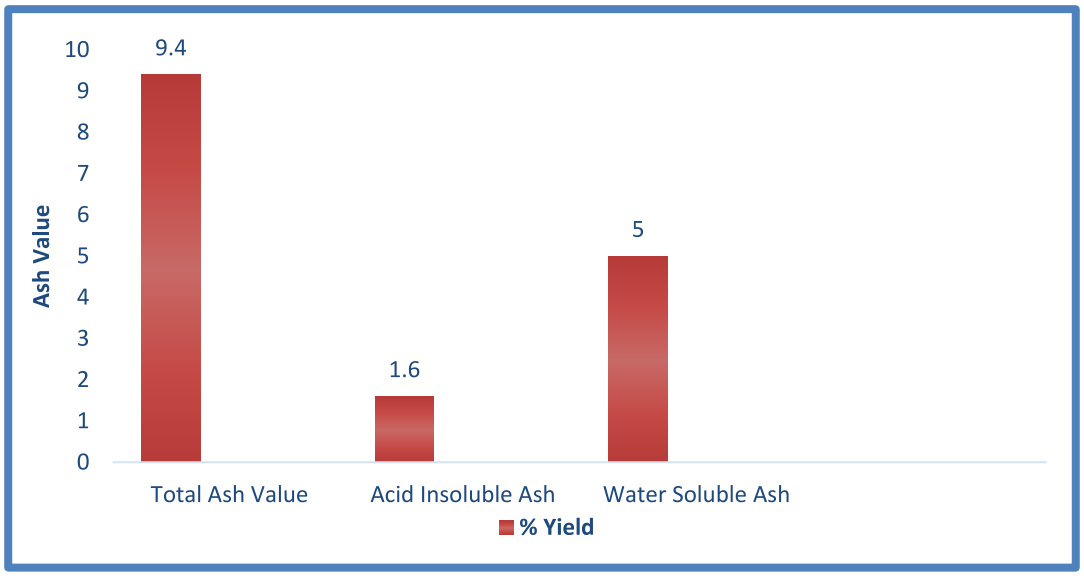

Fig. 8: Graphical representation of whole plant of ash values of *Jar-ul-Nahr* (*Potamogeton natans* L.)

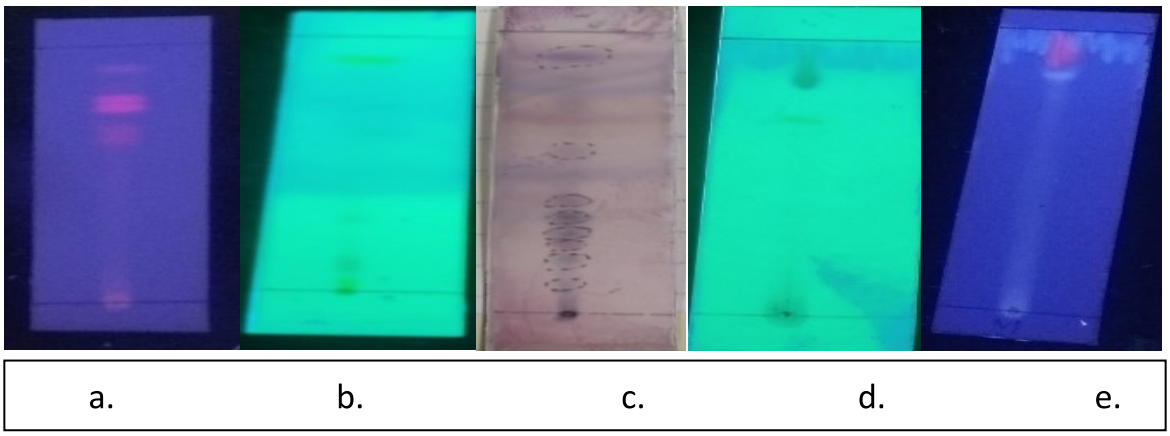

Fig. 9: Showing some plates of TLC a) Petroleum Benzene: Ethyl acetate (7:3) of ethyl acetate b & c) Petroleum Benzene: .Ethyl acetate (8:2) of petroleum ether. d) & e) Toluene: Ethyl acetate: Formic acid: Methanol (1:7:2:1) of Methanol.

Discussion and Conclusion:

Due to the long historical practice and less toxicity of Unani medicines they are gaining more and more attention all over the world for maintaining human heath quality. To satisfy this necessity, the herbal plant materials are interchanged by some unauthentic substituents or adulterants material and also the proper guidelines are not followed for the preparation of formulation etc. So, the safety and quality of crude medicinal drugs as well as of finished herbal products have become a chief concern for health authorities, pharmaceuticals and the public. To stop this adulteration, unethical practice, some sort of uniformity in the manufacture of Unani medicine, the proper standardization process to be needed. (Jitubhai 2011) The present work demonstrates the pharmacognostical evaluation of whole parts of *Jar-ul-Nahr* which will help in proper identification of this plant for future investigations.

The macroscopic examination of drugs refers to evaluation of drugs by color, odor, taste, size, shape and special features, like touch, texture etc. It is a technique of qualitative evaluation based on the study of morphological and sensory profiles of whole drugs. Organoleptic evaluation means conclusions drawn from studies resulting due to impression on organs of senses. All these parameters were recorded for the whole parts of *Jar-ul-Nahr* (*Potamogeton natans* Linn).

The physicochemical study of the drugs includes ash value, extractive values, loss of weight on drying, thin layer chromatography (TLC), pH values, swelling index, foaming index and fluorescence analysis. The results are mentioned in tables as 01, 04, 05, 07, 08, & 10.The extractive values are the parameter for detecting the adulteration in any drug. For establishing the standard of any kind of drug the extractive value plays a major role. To obtain accurate results, the dug should be extracted with various solvents in order of increasing polarity. In this study, the weight of successive extracts in various solvent of whole plant of *Jar-ul-Nahr* were found to be 5.18; 5.47; 14.94 and 33.65 in petroleum ether; ethyl acetate; methanol and hydro alcoholic extract respectively as shown in Fig. 7. Fixed oils, fats, resin and volatile substances are present in petroleum ether extract. The percentage of successive extracts were 0.64%; 0.68%; 1.86% and 4.2% for petroleum ether; ethyl acetate; methanol and hydro alcoholic extract respectively as shown in Table 01. Clearly, the extractive values are on higher side in hydro alcoholic solvent followed by methanolic solvent and are almost equal in petroleum ether and ethyl acetate solvents as shown in Table 01 & Fig. 07. Percentage yield of petroleum ether was found to be least and maximum for hydro alcoholic. This suggests presence of polar constituents out number presence of non-polar constituents from whole plant of *Jar-ul-Nahr.*

Ash value is a residue that is left over after complete incineration of the drugs. Ash value plays a significant role in ascertaining the standard of a drug, because the dust, earthy and unrequired matter are generally added to increase the weight of drug ultimately increasing ash percentage. Therefore, determination of ash value provides the basis for judging the identity and cleanliness of a drug and provides details with regards to its adulteration with inorganic matter. The percentage of total ash, acid insoluble ash and water soluble ash of whole plant of *Jar-ul-Nahr* were found to be 9.4%, 1.6% and 5% respectively (Table 01, Fig. 08). The percentage of solubility of powder drug is also considered as an index of purity. Almost all substances including resin, glycosides and alkaloids etc. can dissolve in alcohol. With respect to soluble extractives percentage of alcohol varies, whereas the drugs obtained from the sources may produce different extractive values, extracted with the same concentration of alcohol (Afaq 1994). Water-soluble constituents like glycosides, mucilage, tannins etc., are determined by water soluble extractive whereas drugs containing tannins, glycosides, resins, etc., are determined by alcohol-soluble extractive and drugs containing volatile constituents and fats are determined by ether soluble extractives.

(Parasuraman S 2014). Percentage of water and alcohol soluble matters in whole plant of *Jar-ul-Nahr* was found to be 5% w/w and 15.2% w/w by hot method; 4.2% w/w and 9.6% w/w by cold method respectively. (Table 01).

The percentage of weight loss on drying at 105^{0}C indicates the loss of water along with volatile substance, which is determined by subtracting weight of drug on drying from weight of the original drug. The loss on drying of whole plant of *Jar-ul-Nahr* was found to be 8.8 %.That is within acceptable limit. The percentage of moisture content ranging from 10-20% indicates a suitable range for minimum bacteria well as fungal growth. (Table 01).

The pH values of 1% and 10% solution of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* L) was found to be 5.5 and 5.6 respectively and indicates the presence of slight acidic nature as shown in Table 05.Since the pH of the drug is acidic, it suggests that the drug will show better absorption in the stomach. (Ali W 2016) The foaming and swelling ability in an aqueous decoction of herb is measured in terms of foaming index and swelling index respectively. In this study, the foaming and swelling index was found to be zero as mentioned in Table 08 and 07.

Sometimes the fluorescence analysis of drug under UV light is very characteristic. When drugs are exposed to ultraviolet radiations many drugs and their constituents emit specific colour because the radiant energy excites the solution which emits that particular colour, known as fluorescence. Fluorescence analysis can provide identification marker for identification of the particular herb. Therefore, fluorescence analysis of the powdered drugs treated with different chemical reagents was done and changes in the color observed can be seen in Table 10. The preliminary phytochemical tests for qualitative assessment for carbohydrates, alkaloids, flavonoids, tannins, phenolic compounds, and terpenoids in the petroleum ether, ethyl acetate, methanolic and hydro alcoholic extracts of whole plant of *Jar-ul-Nahr* was carried out. In results, alkaloids and tannins were present in ethyl acetate and hydro alcoholic extract. Anthraquinone glycosides and flavonoids were present in methanolic and hydro alcoholic extract and cardiac glycosides were present in 3 extracts viz; ethyl acetate, methanolic and hydro alcoholic extract. Tannins and anthraquinones are the major phytoconstituent present in this plant which may be responsible for wound healing action. (Abu-Al-Basal M.2001).Steroids were present in petroleum ether and ethyl acetate extract proteins were present in ethyl acetate and methanolic extracts. Tannins and flavonoids are secondary metabolites to which hemostatic activity can be attributed.

Further an attempt has been made to separate the individual chemical constituents of petroleum ether, ethyl acetate, methanolic and hydro alcoholic extracts by TLC profiling as shown in Fig. 09. A no. of solvent systems of low to high polarity was tried on TLC profiling.The extracts were dissolved in corresponding solvents and were then applied on TLC plates by using suitable capillary tubes. Appropriate solvent system was developed to act as mobile phase for these extracts solutions. The petroleum ether extract of *Potamogetonnatans* L. was applied on TLC plate by using suitable capillary tube and developed TLC plate which swas then separately placed in TLC chamber for development using solvent system as petroleum benzene: ethyl acetate. The developed TLC plate was air dried and then viewed in UV chamber. 8 spots were visible on TLC plate at 365 nm and day light. Similarly, the ethyl acetate extract of *Potamogeton natans* L. was treated in different solvent system. The result was obtained when extract applied on TLC plate, was placed separately in solvent system made of i), pet ether: ethyl acetate (4.5:5.5) and ii) petroleum benzene: ethyl acetate (7:3). The developed TLC plate was air dried and then viewed in UV chamber. 4 spots were visible on TLC plate at 265nm and 365 nm respectively, in solvent system. In case of methanolic extract 3 spots were visible on TLC plate at 365 nm and 254 nm using solvent system made of toluene: ethyl acetate: formic acid: methanol (1:7:2:1). Spots on

above mentioned TLC plates were identified and Retention factor (R_f) was calculated by following method. (Pawar 2014)

$$R_f = \frac{\text{Distance travelled by Solute}}{\text{Distance travelled by Solvent}}$$

Contamination of medicinal plants with heavy metals is a big concern for health. It is vital to analyze heavy metals in both source materials and end products in order to assure that the levels of heavy metals do not exceed the essential limits as established by regulations(Yuan 2011) Heavy metal contaminations are usually caused by environmental pollutants and use of pesticides. The analysis for heavy metals in the drug sample showed that the values for Lead, Cadmuim, and Mercury were found to be mg/ L, 0.0000 mg/ L, 0.0137 mg/L, and 0.8535 mg/L, respectively (Table 9), and were under the permissible limits as per ASU Pharmacopoeias (Bijauliya 2017)

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PUKHRAJ (TOPAZ): A REVIEW ON MEDICINAL UTILITY IN PERSPECTIVE OF UNANI MEDICINE

Mohd Afsahul Kalam[1]* Mohammad Uvais[2], Snober Khan[3], Bisma Ashraf[4], Naureen Naqqash[5] and Toyiba Ibrahim[6]

[1]Research Officer Unani, Regional Research institute of Unani Medicine, Kashmir University, Habak, Naseembagh Campus, Hazratbal Srinagar, J&K, India
[2,3,4,5,6] PG Scholar (M.D), Department of Ilmul Advia, Regional Research Institute of Unani Medicine, Kashmir University, Habak, Naseembagh Campus, Hazratbal Srinagar, J&K

Review Paper

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ABSTRACT

This comprehensive study delves into the vernacular names, etymology, identification, historical significance, medicinal properties and chemical constituents of the Topaz, It is a renowned and valuable gemstone resembling diamonds, considered one of the hardest. Beyond its ornamental value Topaz is acknowledged for its medicinal benefits serving as exhilarant for the heart, cardiac tonic, and tonic for vital organs. The gem exhibits a range of properties, blood purification, antidote for poisoning, and relief from various ailments. Drawing insights from classical Unani literature and recent research, this review aims to provide a well-rounded understanding of Topaz's multifaceted attributes.

No. of Pages: 5 **No. of Figs: 1** **No. of Table: 1** **References: 12**

Keywords: Topaz, Yaqut-i-Asfar, Yaqut-i-Aṣghar, Pukhrāj, Cardiac tonic, Antidote.

INTRODUCTION

In Unani System of Medicine various sources like plant, animal and mineral are used to prevent from diseases and used to cure various ailments. Several drugs from mineral sources like Zumurrud, Marjān, Lājward etc. have been used since time immemorial.[1,2,3] Topaz is a renowned and valuable gemstone resembling diamond, considered one of the hardest. It is formed through the action of aluminium and a colourless gas, fluorine. From a metaphysical standpoint, it is believed to possess high qualities. According to research, the first Topaz gemstone, was discovered around a thousand years ago in the Red Sea. The heaviest Topaz gemstone known as "The American Gold Topaz" was found in the Gerais region of Brazil, weighing approximately 22,892.5 carats, and is currently housed in the Smithsonian's National Museum of Natural History in Washington[4]. Yellow topaz is best in quality, it is the original colour, darker the colour, higher the price of topaz. Medicinally yellow topaz is considered exhilarant for the heart, cardiac tonic, and tonic for vital organs, enhances and protects Ḥarārat-i-Gharīzī (innate heat or energy), and relieving anxiety.[5]

*Corresponding author: afsahnium@gmail.com

MATERIAL AND METHODS

Several credible sources, both in print and digital formats, were meticulously reviewed to gather comprehensive data on Pukhraj (yellow Topaz) encompassing its types, properties, and uses in Unani Medicine, compound drugs, recent studies etc. The classical literature of Unani Medicine was referenced to gather information about the historical affiliation and therapeutic uses of Pukhraj (yellow Topaz), and newer editions were also consulted to compile the most recent information. Also, the appropriate Unani terminologies were referenced from the Standard Unani Medical Terminology published by the Central Council for Research in Unani Medicine in collaboration with the World Health Organization.

Mutaradifat (Vernacular Name):

Arabic:	*Yaqut-i-Asfar* / *Sraq* [6]
English:	topaz[5]
Farsi:	*Yaqut-i-Arzaq, Pukhraj* [4]
French:	Topace[5]
Hindi:	*Poshaprag, Poshbah, Yushrag.* [4]
Punjabi:	*Pokhraj* [4]
Sanskrit:	*Pushprag, Sanjole*[5]
Urdu:	*Pukhraj* / *Yaqut-i-Zard* [5]

***Shanakht, Mahiyat and Husul* (Identification, Nature and Acquisition):**

The word "Topaz" is derived from the old French word "Topace," meaning a sparkling gem, and it is also associated with the Sanskrit word "Tapas," meaning heat and fire[5] It is a renowned and valuable gemstone resembling diamonds, considered one of the hardest. Topaz is formed through the action of aluminium and a colourless gas, fluorine.[4] From a metaphysical standpoint, it is believed to possess high qualities, having a cool temperament and a slightly sour taste. In ancient times, kings adorned themselves with this gem on their crowns and sword hilts. According to research, the first Topaz gemstone was discovered around a thousand years ago in the Red Sea. Its significance can be estimated from its mention in the Biblical text, where it is referred to as "Assyrian" meaning brightness in the Gospel[4]. The heaviest Topaz gemstone, known as "The American Gold Topaz" was found in the Gerais region of Brazil, weighing approximately 22,892.5 carats, and is currently housed in the Smithsonian's National Museum of Natural History in Washington[4]. Topaz is found in various colours, including brown, red, and rose, in Brazil and Sri Lanka. Pink Topaz is available in Pakistan and Russia, while yellow Topaz can be found in Brazil, Sri Lanka, Nigeria, and China. In addition to these, Topaz is also found in India, Siberia, Russia, Africa, Iran, etc. Yellow Topaz, resembling the colour of citrine flowers, is highly valued. Experts classify it into two types: Eastern and Western. The Western Topaz contains only aluminium, silica, and fluorine[5] while the Eastern type has additional elements.

To identify genuine Topaz, it should feel smooth when placed on the palm, have a substantial weight, and naturally exhibit a sparkling appearance. To test its authenticity, immerse the gemstone in milk for twenty-four hours; if it maintains its lustre, it is genuine.

Fig. 1: Pukhrāj (yellow Topaz) gemstone.

Topaz comes in various types based on colour, including:[4]

1. White Transparent Topaz: Used in jewellery and various ornaments
2. Yellow topaz: best quality topaz known as Pukhraj
3. Blue topaz: beautiful in colour
4. Dark green topaz
5. Pink topaz: also called Brazilian topaz
6. Brown topaz
7. Red topaz: rarest, Precious, fire resistant[7]

There are four types of topaz in Sanskrit book:[4]

1. White topaz-Brahmani
2. Redish topaz-Kshatriya
3. Yellowish white topaz- Vaishya
4. Blackish topaz- Kshudra

Yellow topaz is best in quality, it is original colour, darker the colour, higher the price of topaz

***Mizaj* (Temperament):** Hot and Dry class 2 [7]

***Nisbat-i-Sitāra* (Associated Star):** Related to Jupiter

Af'al (action)

Muqawwi-i-Qalb (cardio tonic),[8] *Muqawwi-i-Mi'da* (stomachic), *Muqawwi-i-Am'a* (intestinal tonic**),** *Mun'ish-i-Ḥararat-i-Ghariza*[7]*, Muhafiz-i-Ḥararat-i-Ghariziyya* (protect innate), *Habis al-dam* (haemostatic).[6]

***Iste'malat* (Therapeutic uses)**:

Unani physicians used this stone in various forms like Kushta, powder etc. in several compounds to treat various ailments including:

- *Dast wa Pechish* (diarrhoea and dysentery) [6]
- *Bawasir* (haemorrhoids) [9]
- *Yaraqan* (jaundice) [4]
- A*tashak* (syphilis) [4]
- *Juzam* (leprosy) [9]
- *Khārish* (itching) [4]
- *Chapākī* (urticaria) [4]
- *Baras* (vitiligo) [4]
- *Ganj* (alopecia) [4]
- *Sozish-i-Bawl* (burning micturition) [4]
- *Hasah al-Mathana* (Bladder stone) [4]
- *Waja' al-Asnan* (Tooth ache) [4]
- *Sartān-i-Damwa* (blood cancer) [4]
- *Khafaqan* (palpitation) [6]
- *Junan* (mania) [6]

It is effective in treating these ailments and neutralizing toxic effects.[8]

If someone is bitten by a poisonous insect, rubbing this stone on the affected area eliminates the venom's impact.[8]

It has the following benefits when worn: [4, 7]

White Topaz broadens the mind and promotes knowledge.

Green Topaz helps to eliminate negative intentions and fosters positive thoughts.

The yellow Topaz assists in financial prosperity and practical wisdom.

Wearing blue Topaz creates a tranquil atmosphere, enhancing human abilities and maintaining mental balance.

***Miqdar* (dosage):** Stones are mainly used for wearing in rings, neckless etc. but sometimes it is used for medicinal purposes by making it Kushta. The dose of which mentioned as 30-120 mg orally.

***Madarrat* (adverse effects):**

Certain varieties of topaz have negative effects on the body; for example, the yellow Topaz weakens evident weakens the brain. Wearing stones with contrasting colours like yellow and red together can lead to neurological disorders.[4]

Table 1: Showing compound formulation having Topaz as one of the important ingredients [10,11,12]

S.N.	Compounds	Uses	Dose
1.	*Ḥabb-i-Jawāhir*	Tonic for vital organs, Haemostatic, Anti diarrhoeal	125mg
2.	*Safūf-i-Jawāhir Mohra*	Tonic for vital organs, General tonic	60-120mg
3.	*Mufarriḥ Dilkashan*	Cardio tonic, Melancholic diseases	5g
4.	*Mufarriḥ-i-Azam*	Cardio tonic, Palpitation, Anxiety, Melancholic diseases, and diarrhoea	7g
5.	*Ma'jūn Mubhi Intaki*	Aphrodisiac, Spermatorrhoea, and Increase muscle mass and strength	12g

Recent studies on Pukhraj:
Topaz contains specific chemical components such as Iron, Silica, Aluminium, Fluorine, Magnesium, etc. Its hardness on the Mohs scale ranges from 8.0 to 9.0. It is a transparent gemstone with a density of 3.49-3.57.[5] Its chemical formula is Al2SiO4 (F, OH) 2 hydroxy aluminosilicate. It can only be cut with diamond and sapphire. Even when heated with a blowtorch, it does not melt. When heated gradually, it becomes glass-like, and if exposed to intense heat, bubbles form and it breaks instantly. Yellow topaz loses its color when heated, turning colourless. Exposing it to acid turns it into a blue hue.[4] No clinical or experimental studies have been done on Topaz.

CONCLUSION
Pukhraj (yellow Topaz), recognized as a precious gemstone among, holds a longstanding reputation in Unani Medicine for its therapeutic potential in treating ailments related to heart, skin diseases, blood cancer, and as a Tiryaq etc. Despite its historical medicinal use, scientific exploration of its pharmacological properties remains scarce. This paper endeavors to uncover the traditional medicinal application of Pukhraj (Yellow Topaz) as outlined by Unani experts.

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ANTI-OXIDANT ACTIVITY OF AN AQUATIC PLANT *JAR-UL-NAHR* (*POTAMOGETON NATANS* LINN): A UNANI DRUG

Iqra Rifat[1], Mohd. Afsahul Kalam[2], Suheena Khanday*[3] and Huzaifa Salati[4]

[1]JRF (Pharmacovigilance), Regional Research Institute of Unani Medicine, Srinagar, J&K
[2]Research Officer (U), Regional Research Institute of Unani Medicine, Srinagar, J&K
[3]Research Officer (U), Central Council for Research in Unani Medicine, New Delhi
[4]PG Scholar Deptt. Ilmul-Advia, Regional Research Institute of Unani Medicine, Srinagar, J&K

Research Paper

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ABSTRACT

The aim of this study was to evaluate the *in vitro* antioxidant assay of methanolic and hydro alcoholic extracts of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn). Antioxidants, also known as inhibitors of oxidation, are compounds that delay or prevent the oxidation of substances, thereby extending their life span. Oxidative stress, resulting from free radicals impact various enzyme systems causing damage that may contribute to conditions like cancer, ischemia, aging, adult respiratory distress syndrome, rheumatoid arthritis, and more. A plant-based diet offers protection against chronic diseases related to oxidative stress due to the antioxidants found in dietary plants. These plants contain diverse chemical families and varying amounts of antioxidants, which are believed to contribute to the health benefits of plant-based diets. Hence, the present study was carried out to evaluate the antioxidant potential of *Jar-ul-Nahr* (*Potamogeton natans* Linn).

Methods: The anti-oxidant activity of methanolic and hydro alcoholic extract was investigated by DPPH radical scavenging against BHA as standard control. In this study, five concentrations (0.125mg/mL,0.25mg/ml, 0.5 mg/mL, 1mg/mL, 2mg/mL and 4mg/mL)of the methanolic and hydro alcoholic extracts of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn)were tested. The antioxidant activity of each extract increased with increasing concentration. The inhibition of the DPPH free radical was found in concentration dependent manner.

Results: On comparing the solvent wise DPPH radical scavenging activity of whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn), the reduction ability was found higher in hydro alcoholic extract followed by methanolic extract with little difference.

Conclusion: In conclusion, *Jar-ul-Nahr* (*Potamogeton natans* Linn) which is reported to have significant activity against several human ailments, could be exploited as potential source of natural antioxidants for plant based pharmaceutical industries.

No. of Pages: 7 **No. of Figs: 2** **No. of Table: 1** **References: 10**

Keywords: Jar-ul-Nahr, Antioxidant.

*Corresponding author: suhinakhanday@gmail.com

Introduction:

Since thousands of years, civilizations throughout the world have used medicinal plants to treat a variety of diseases. The oldest written confirmation of medicinal plant usage was found on a Sumerian clay slab, approximately 5000 years old (Petrovska, 2012) Plants contain numerous antioxidants that are primarily produced as secondary metabolites. Phytochemicals, literally meaning 'plant-chemicals,' are non-nutritive chemical components of plants that offer numerous health benefits and disease prevention properties. While these nutrients are non-essential—meaning they are not required by the body for sustaining life —they confer significant health benefits when consumed by humans. Plants produce these chemicals to sustain their own life processes, which, in turn, provide health benefits to humans upon consumption. There are over a thousand known phytochemicals, classified as primary or secondary constituents based on their roles in plant metabolism. Phytochemicals have significant nutraceutical importance (Lawal 2016). They are bioactive constituents that maintain health and serve as a bridge between the food and pharmaceutical industries. Phytochemicals perform numerous functions and possess unique pharmacological effects such as anti-inflammatory, antispasmodic, anti-allergic, antioxidant, antibacterial, antifungal, chemopreventive, neuroprotective, hypotensive, and anti-aging properties. They stimulate the immune system, block the formation of carcinogens, reduce oxidation, slow the growth rate of cancer cells, reduce inflammation, trigger apoptosis, prevent DNA damage, and regulate hormones such as estrogen and insulin, which, in excess, are linked with an increased risk of breast and colon cancer (Karamac 2019).

Several plants possess natural antioxidants that counteract oxidizing species and free radicals produced by the body. 65 Antioxidants can be sourced both internally and externally. Internally, antioxidants are generated through the activity of body enzymes, including superoxide dismutase (SOD), catalase (Cat), and glutathione peroxidase. Externally, antioxidants are obtained from dietary sources such as vitamins A, E (alpha-tocopherol), C (ascorbic acid), minerals, and polyphenols, which are predominantly plant-based (Nwozo 2023). Natural antioxidants that are of plant origin, especially oral herbs, have fewer side effects than chemical antioxidants and helps in protecting the body against free radicals. Flavonoids act against the detrimental effects of reactive oxygen species (ROS) such as superoxide radicals, by acting as antioxidant. Excessive production of free radicals may lead to tissue injury (Nargesi S 2018). Cell membranes that are composed of unsaturated lipids are most susceptible to free radicals. High concentrations of free radicals in cells and tissues induce oxidative stress, which can be produced by a variety of detrimental factors such as X-ray radiation, UV, gamma, strenuous physical exertion, smoking, drug addiction, alcoholism, stress and drug addiction. Chronic oxidative stress has been reported to produce a variety of diseases that includes cancer, heart related diseases, and increases the pace of aging. Several secondary metabolites of lipid oxidation, such as 4-hydroxynonenal and malondialdehyde, can react with biological components such as proteins, amino acids, and DNA. Malondialdehyde can be formed both enzymatically and non-enzymatically, and has been linked to health issues such as mutation and carcinoma (Yashin A 2017). There is growing recognition that oxidative stress, which arises from an imbalance between reactive molecule production and neutralisation, is the primary cause of many diseases prevalent in today's world (Hazra 2008). Because Unani treatments are safe and have a proven track record of effectiveness, they are also considered to be reasonably priced. Along with a range of naturally occurring antioxidants, they also contain vitamins, minerals, active steroids, alkaloids, glycosides, and tannins. In this study, whole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn), regularly prescribed by local practitioners

to cure various ailments, is subjected to screening for antioxidant activity. Till date, data about antioxidant property of this plant were lacking, therefore, this study was reported for evaluation of its *in vitro* antioxidant potential including the scavenging of DPPH.

Mechanisms of action

Free radicals are highly reactive species with short lifespans that cause damage to macromolecules such as proteins, DNA, and lipids. These reactive oxygen species (ROS) tend to react with electrons from other molecules in the body, impacting various enzyme systems and causing damage that may contribute to conditions like cancer, ischemia, aging, adult respiratory distress syndrome, rheumatoid arthritis, and more. It is assumed that antioxidantsact by two modes. The first one involve process of breaking a chain, in which the primary antioxidant donates an electron to a free radical in the system (e.g., lipid radical), that results in the formation of a new and more stable radical. Flavonoids, ascorbic acid and tocopherols are examples of primary antioxidants. The second mechanism includes removal of ROS initiators (secondary antioxidants) by quenching chain-initiating catalyst. This mechanism is capableof deactivating high energy species like absorption of UV light, O_2, chelations of metal catalyzing free radical reactions or by inhibition of peroxidases, such as lipoxygenases or xanthine oxidase. A secondary is any chemical that can react with the initiating radical and suppresses the initiating enzyme or reduces the O_2 level without creating ROS (Diplock 1998).

In non-dividing cell, cancer rarely occurs. Mutation can occur when a cell multiplies and its DNA is damaged. ROS damage to cells has been shown in vitro and in vivo studies and has indicated that it may play the role of carcinogenesis in different ways (Diplock 1998).

They may cause:

- ✓ Structural change of DNA such as gene sequence amplification.
- ✓ Mutations in Base pair (the oxidized form of guanine has altered base-pairing properties) and translocations.
- ✓ Activation or suppression of signal transduction pathways – in the majority of squamous cell carcinomas of the lung, over expression of a growth factor receptor is commonly involved.
- ✓ Abnormal cell-to-cell communication that permits unrestricted cell proliferation.
- ✓ Interference with genes that control cell growth, inhibiting apoptosis or necrosis.

Damage to proteins e.g. DNA repair enzymes, makes it more difficult to correct a mutation, once it has occurred. The immune system is able to provide protection and to prevent the body from invading organisms and to remove damaged, aged or modified cells that that can lead to cancer. All cell membranes, including white blood cell membranes are made up of lipids, which are vulnerable to free radical damage. It has now been revealed that there are number of connections between free radical reactions and immune cell dysfunction. White blood cells membrane fluidity can be reduced by reactive oxygen species (ROS), lowering their function dramatically. The loss of membrane fluidity has been linked to lymphocytes diminished ability to respond the immune system stimuli. Immune cells DNA can also be damaged that result in mutations and impairs normal functioning of cell. Ironically, certain chemotheraphy medications and radiation used in treatment of cancer are based on damage of free radical. The barrage of free radicals that indiscriminately damage good cells as well as malignant ones results in well documented side effects such as hair loss, lowered immunity and gastro-intestinal disorders. (Pendry BA 2005).

The term '*Harārat Gharība*' (external heat) is commonly used in the Unani System of Medicine and corresponds to excessive or unnatural heat; it is assumed to be the main predisposing factor for responsible for changing normal humours as it produces *Ihtirāq*. Similarly *Ihtirāq* in Unani medicine, modern medicine

defines oxidative stress (OS) as a critical tissue-destructive mechanism and a major factor in the development of chronic diseases. Harman proposed the free radicals theory in 1950, which states that,"free radical damage to cellular macromolecules in aerobic organisms affects their lifespans". OS is a disproportion between systemic generation of reactive oxygen species and a biological system's ability to readily detoxify the reactive intermediates. Reactive oxygen metabolites (ROM) also known as free radicals are oxygen-containing molecules that have one or more unpaired electrons which react and damage other cellular content including proteins, lipids, and DNA. Similary, *Ihtirāq*damages the normal humoral composition (Kausar F 2020). Sylvie *et al*., found that increased rates of resting energy expenditure are linked to greater levels of inflammation and OS is associated with higher rates of resting energy expenditure (REE). Itillustrates that higher REE corresponds to raised heat production and it is linked to OS. This raisedheat is clearly linked with '*Harārat Gharība*' as stated in classical literature. Furthermore, oxidation is typically an exothermic process that produces heat. As a result of the undesired oxidation, unwanted heat is produced, which burns the normal cellular constituents. By the related denominators of combustion and excess heat, the OS of bio molecules links to the *Ihtirāq*of Unani pathology. However, along with holding excess heat co-relatable with OS as a basic pathology, an even more significant point is that Unani Medicine shows combustion and excess heat to be more than a massive and simple increase in heat; instead depending on different cause and associations; it comes in a variety of forms with each particular forms of excess heat requiring very different types of treatments rather than simple increasers of coldness (Kausar F 2020).

MATERIALS AND METHODS

Source of data collection

The data were collected from Regional Research Institute of Unani Medicine (RRIUM), Srinagar Jammu and Kashmir.

Plant material collection

A survey tour to Dal Lake in Srinagar, J&K was conducted on 13 August 2021, to collect plant specimen during its flowering stages for future reference and preparation of herbarium for authentication of identification. Another survey tour to Dal Lake was conducted in December 2021 to collect plant specimen without flowers for making herbarium and for conduction of research work. The collection was done in the same area of Dal Lake where it was done before. The voucher specimen was deposited in the herbarium of survey of Medicinal Plants Unit (SMPU), RRIUM, Srinagar under voucher specimen no.5866-5869.

Identification and authentication of plant material

The plant was also authenticated by Dr. Akhter H. Malik KASH, and submitted in the museum of Centre for Biodiversity and Taxonomy (CBT), University of Kashmir under specimen voucher No.8040. A sample specimen of collected material of the plant was deposited in herbarium, Department of Botany, Kashmir University J&K for the future references.

Chemicals and Reagents

All the solvents, chemicals and reagent used in the present research work were of analytical grade (Merck Specialties Private Limited, Mumbai, Himedia laboratories Pvt Ltd, Mumbai). The solvents used for extraction were Methanol, and Hydro alcohol.

Extraction of crude drug material:

The whole part of the plant of Jar-ul-Nahr (*Potamogeton natans* L.) was collected, cleaned and dried under shade at room temperature. The dried whole plant was pulverized using stainless steel mixer grinder.600g dried coarsely powdered material of whole plant of Jar-ul-Nahr was subjected to extraction in soxhlet apparatus. Soxhlation was performed at 600c using Methanol and Hydro-alcohol. In each solvent, Soxhlation was continued until no colour was observed in siphon tube and evaporated for residue. Absence of residual confirmed the completion of extraction. The extracts were

evaporated until they were completely dry.

Antioxidant activity

Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity

DPPH radical scavenging activity of extracts was determined by method described by Pellegrini *et al.* (1999). The DPPH reagent was DPPH (8 mg) dissolved in MeOH (100 mL) for a solution concentration of 80μL/mL. To determine the scavenging activity, 100μL DPPH reagent was mixed with 100 μL of stock solution in a 96 well microplate and was incubated at room temperature for 30 min. After incubation, the absorbance was measured 514 nm using an Elisa reader (Erba Chem-7 Semi automated analyzer). Stocksolution of the Methanolic and hydroalcoholic extract was prepared to the concentration of 4mg/mL, 2mg/mL, 1mg/mL, 0.5mg/mL, 0.25mg/mL. The experiment was repeated three times. BHA was used as standard controls. The radical scavenging activity was determined by using below equation:

$$\% \text{ Inhibition} = (A_{\text{Control}} - A_{\text{Sample}})/A_{\text{Control}} * 100$$

Where, A_{Control} represents absorbance of control at t=0 min and A_{Sample} represents absorbance of sample at t=30 mins. BHA was used as reference standard and IC_{50} values were calculated for each test solution i.e conc. required to inhibit formulation of DPPH radical by 50%.[120]

Statistical analysis

Graph Pad Prism 7.0 (Graph Pad software, Inc.) and MS(Microsoft) Excel 2007 were used for statistical analysis and graph composition. The measured data is expressed as the mean ± Standard deviation (SEM) of a minimum of three independent experiments. The statistical significance between control and treatment groups was determined by unpaired t–test and between multiple groups by one way analysis of variance (ANOVA). The significance level was set at $p<0.001$.

Result

The DPPH radical scavenging activity of methanolic and hydro alcoholic extracts ofwhole plant of *Jar-ul-Nahr*(*Potamogeton natans* Linn) were determined by the decrease in absorbance induced by plant antioxidants. Five concentrations (0.125mg/mL,0.25mg/ml, 0.5 mg/mL, 1mg/mL, 2mg/mL and 4mg/mL)of the extracts were tested. The antioxidant activity of each extract increased with increasing concentration. The inhibition of the DPPH free radical was found in concentration dependent manner. On comparing the solvent wise DPPH radical scavenging activity ofwhole plant of *Jar-ul-Nahr* (*Potamogeton natans* Linn), the reduction ability was found higher in hydro alcoholic extract followed by methanolic extract with little difference. Percentage inhibition for hydro alcoholic and methanolic extract was calculated to be 29.698% and 29.44% respectively and IC_{50} were 3.044 and 2.832 respectively and reduction ability of BHA was 52.34 and IC $_{50}$value was 3.044 as shown in Table1; Fig.1& Fig.2.

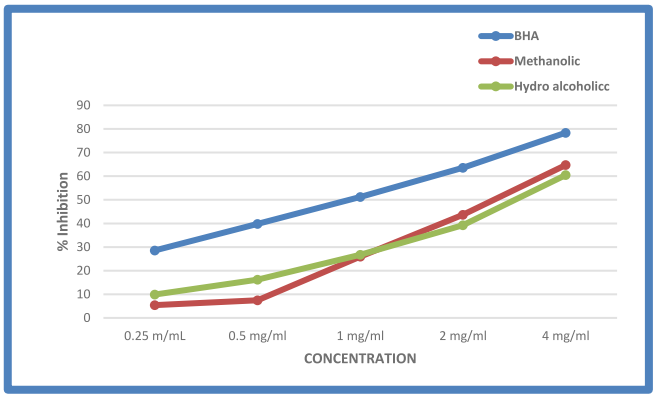

Fig.1: Graphical representation of DPPH radical scavenging activity of BHA, methanolic and hydro alcoholic extracts of whole plant of *Jar-ul-Nahr* (*Potamogeton natans L*).

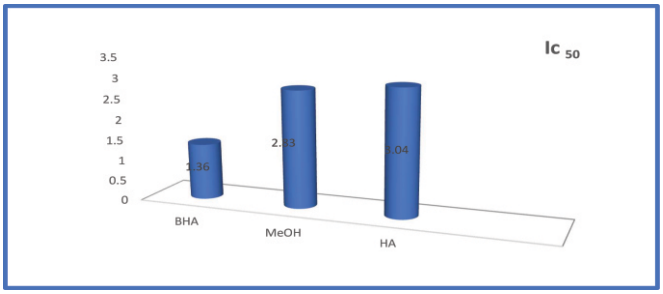

Fig. 2: Graph representation of $IC_{50}$of BHA, MeOH and HA extracts of whole plant of *Jar-ul-Nahr* (*Potamogeton natams* L.).

Table 1: DPPH based % inhibition and IC_{50} value of whole plant of *Jar-ul-Nahr*.

Concentration (mg/ml) / Solvent type	Percentage Inhibition					Mean	IC 50 (mg/mL) M
	0.25 mg/mL	0.5 mg/mL	1 mg/mL	2 mg/mL	4 mg/mL		
BHA (standard control)	28.56	39.8	51.2	63.56	78.4	52.34	1.361
Methanolic extract	5.41	7.49	25.94	43.66	64.72	29.44	2.832
Hydroalcoholic extract	9.89	16.26	26.76	39.23	60.49	29.69	3.044

Conclusion

Unani plant *Jar-ul-Nahr* (*Potamogeton natans* Linn) that is reported to have significant activity against several human ailments showed antioxidant activity as evidenced by the scavenging of the free radicalDPPH. It was concluded that antioxidant activity of two extracts (MeOH and HA) of *Jar-ul-Nahr* increased with increasing concentration (0.125 mg/mL,0.25mg/ml, 0.5 mg/mL, 1mg/mL, 2mg/mL and 4mg/mL) with higher antioxidant activity in hydro alcoholic extract followed by methanolic extract with little difference.

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A BRIEF CONCEPTUAL OVERVIEW OF *IRQUN-NASA* (SCIATICA) - A REVIEW

Abuzar Lari[1]*, S. Mohammad Akram[2], Musarrat Ali[3], Zaid Iqbal[4] and Ansari Mushir[5]

[1]Assistant Professor in Dept of Ilaj-bit-Tadbeer. Mohammadia Tibbia College, Malegaon
[2]Associate Professor in Dept of Ilaj-bit-Tadbeer. Mohammadia Tibbia College, Malegaon
[3]Assistant Professor in Dept of Ilmul-Saidla. Mohammadia Tibbia College, Malegaon
[4]Assistant Professor in Dept of Tashreeh-ul-badan. Mohammadia Tibbia College, Malegaon
[5]Assistant Professor in Dept of Ilmul-Advia.
Dr. MIJ Tibbia Unani Medical College, Versova, Mumbai

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ABSTRACT

In *Unani* System of medicine *Irqun-Nasa* is a nervine pain which initiates from *Pusht* (Lower back) and descends to lower limb and ankle joint. Other synonyms of *Irqun-Nasa* are *Rengan bau* and *Langdi ka dard*. Eminent *unani* scholars explained *Irqun-Nasa* in details and its probable causes, patho-physiology, symptoms and management in ancient literature. This review paper, An attempt to explore a brief concept to understand *Irqun-Nasa* in light of *Unani* medicine. Various kind of crude drugs and therapies are practiced for the management of *Irqun-Nasa* are discussed in full length paper, also there is brief review on historical background of *Irqun-Nasa* has been discussed.

No. of Pages: 5 **References: 40**

Keywords: *Unani*, *Irqun-Nasa*, *Rengan bau*, *Langdi ka dard*, *Pusht*, Eminent, Ancient.

Introduction & Historical background of *Irqunnasa* (Sciatica)

Renowned Unani Physician *Hippocrates* (460-377 BC) was the first person who described about the treatment of *Irqunnasa* (Sciatica). He referred it as 'ischiatic' pain affecting men between 40 and 60 years. He advocated traction as a beneficial method to relieve pain and loss of function. He observed that young men described pain that lasted about 40 days before resolving spontaneously[1]. In the *Tafseer* of *Quran*, it is mentioned that *Hazrat Yaqoob* suffered from *Irqunnasa*. *Abul Hsan Ali Ibne Raban Tabari* (770-780AD) described *Irqunnasa* and mentioned *Safra* as its cause [2]. *Zakaria Razi* (865- 925AD) described *Irqunnasa* (Sciatica) as joint pain similar to other arthralgias like *Niqras* and categorized it as a type of *Wajaul Mafasil* [3]. In *Baghdad*, he claimed to have successfully treated 1000 cases of sciatica, mostly by bleeding in one of the lower extremities[1,4]. *Ibne Sina* (980-1037AD) defined *Irqunnasa* as one of the *Waja-ul-mufasil* characterized by hip pain which radiates towards the groin up to the ankle[5]. *Abumarwan Abdul Malik Ibn Zuhr* (1092-1162 AD) opined sciatic pain originates from foot and radiates up to hip with muscular spasm and discomfort in leg[6]. In 1451AD, the first known

*Corresponding author: abuzarlari123@gmail.com

use of the word sciatica[7]. *Akbar Arzani* (1721 AD) described *Irqunnasa* with its cause as early descending of *Madda* as compare to other types of *Wajaul Mafasil* [8]. *Hakim khwaja Rizwan* mentioned about *Irqunnasa* as the nerve *Irqunnasa* is always full of black *Dam* to which *Tabiyat* diverts towards lower side like descending of blood in '*Dawali*' (Varicose veins) [9]. *Hakim Alwi Khan* (1669 AD- 1747AD) treated Sciatica through venesection of saphenous vein[10]. In mid of 19th century, Author of *Ikseerul Quloob* mentioned that *Hijama* over both ankles is beneficial in *Irqunnasa* [11]. In the same era, *Hakim Haider Ali khan* mentioned that *Irqunnasa* occurs oftenly in woman after delivery and remains up to 40 to 60 years of age [12].

DEFINITION

The *Irqunna'sa* is an Arabic term, which comprises "*Irq*" and "*Nasa*"(a name of a nerve) which starts from gluteal region and continues up to the ankle, and pain associated with this nerve is pronounced as *Irqunna'sa*[13,14]. it is also used synonymously with several names such as: *Irqunna'sa* [15,16] *Langdi ka dard* [13,17] *Rengan bao*, *Rengni* [18].

The concept of radiculopathy is described by *Unani* physicians as (Loss of sensation is sometimes due to involvement of associated lumbar or cervical nerve roots presenting symptoms in associated organ[8,18,19]. *Irqunnasa* as a pain which affects the nerve namely "*Annasa*", and the association of pain depends on the intensity of the *Madda* and its duration of descends, greater the period of descends leads to increase in radiation of pain towards the bottom, and it also causes weakness of the organ[21]. According to *Shaikh Ibne Sina* "*Irqunna'sa* is a type of *Waja ul Mafasil* characterized by hip pain (buttock) radiating towards the groin up to the ankle"[5,22] *Mohammed Ismaeel Jurjani* described that the pain which originates from ischial joint and radiates towards leg, called *Irqunna'sa* [20]. According to *Ibne Zakaria Razi*, *Irqunna'sa* is the pain which starts from hip and radiates up to thigh, sometimes even up to calf muscles and leg[3,4,23]. *Ibne Hubal Baghdadi* defined *Irqunna'sa* as *Razi* with the addition as "a pain initiate from hip and radiates from the lateral of the thigh up to calf muscles[3,24] It is the pain which originates from hip and radiates towards lateral side of thigh, up to knee joint or ankle joint [9]. *Irqunna'sa* is defined as a hip pain, which is situated between *Azmul Warik* or *Sureen* and *Ran* [25]. *Irqunna'sa* is a form of *Wajaul Mafasil*, in which pain originates from hip posteriorly and radiates towards knee, then upto ankle and it descends more lower by increasing chronicity and sometimes reaches up to fingers depending upon the amount of *Madda* on applying pressure over the fingers [26]. *Irqunna'sa* is a hip pain which radiates towards the groin and even up to the knee, ankle and fingers. The intensity of pain and its radiation depends upon the amount of *Madda* [27,28] *Allama Sadeeduddin Al Karzooni* in his book "*As Sadeedi*" described *Irqunna'sa* as a pain which originates from hip joint (*Mafsale Warik*), and radiates up to knee, ankle and sometimes up to fingers. The radiation of pain depends upon the duration of illness and the quantitative involvement of the *Madda* [29]. According to *Abu Marwan Abdul Malik Ibne Zuhr* (1092-1163AD) the author of "*Kitabut Taisir fil Mudava wat Tadbeer*", the *Irqunna'sa* pain sometimes originates from foot and radiates up to the upper most part of the thigh that can be affected to any of the leg with mild discomfort [6].

According to *Hakim Akbar Arzani*, there are four types of joints pain viz *Wajaul Mafasil*, *Niqris*, *Wajaul Warik*, *Irqunna'sa*,

Accordingly defined *Irqunna'sa* as a fourth type of joint pain, in which the pain originates from hip joint and radiates laterally, and medial side occasionally and sometimes up to fingers of foot[8]. *Hakim Azam Khan*, described in "*Ikseer Azam*" that *Irqunna'sa* synonymously used as "*Rengan bao* "and defined it as a pain which starts from hip joint and radiates laterally in the thigh, and even up to the finger of foot. It is also mentioned that this pain (*Irqunna'sa*) may likely to occur as a result of the long lasting sequel of hip joint pain

(*Wajaul Warik*)[18]. In *Irqunna'sa*, *Madda* descends from ischium towards fingers of foot. It is also said that it is not compulsory that *Madda* will spread throughout the course described [30].

Radicular pain

Irqunna'sa is also pronounced as "*Langdi ka dard*" because the pain makes the patient unable to walk properly or behaves like lame. Similarly it is also being in use with other names such as "*Rengan bao*"or "*Rengni*" because the prolong effect of the pain makes the patients to creep or to plod [18].

CLASSIFICATION OF *IRQUNNA'SA*

I. On the basis of *Khilt* involved [25]:

1) *Damvi* (2) *Balghami* (3) *Safravi* (4) *Saudavi*

II. On the basis of *Kaifiyat*:

1) *Har* (2) *Barid*

***Asbab* (Causes)**

Madda

1. *Balghame kham* [4,18]
2. *Balghame Ghair Tabai* mixed with *Dam*, *Sauda* and *Safra* [18,4]
3. *Dam* with *Raddi Akhlat* [24]
4. Abnormal *Safra* [2]
5. *Khilte Dam Ghaleez* [31]
6. *Khilte Balgham Ghaleez* [31]
7. Accumulation of *Fuzlat*, *Lesdar rutubat*, *Chemoos* (chyme) over joints, *Rutubat e Mukhatia*[24,4]
8. Descending of *Har* and *Barid Fuzlat* , *Muzi Madda* and *Nazli rutubat* [32]
9. *Ghalbae Akhlat*, *Ghalbae Rutubate Balgham* mixed with *Safra*, *Ghalbae Dam*, *Qillate Sauda*, *Sue Mizaj Sauda* and *Riyah* [24]
10. *Buroodat* of the *barid khilt* leading to acute pain, Lysis of *Buroodat* causes evaporation which proceeds to *Tamaddud* (stretching) [33]
11. *Mizaj Har Yabis* [12]
12. *Ghiza e Ghaleez* [24]
13. Excessive sexual intercourse (after full stomach) [24]
14. Sitting on hard objects [4,5]

Clinical features of *Irqunna'sa* (Sciatica)

1. Pain
2. Radiating pain from lower back to Buttock [31,32] Ankle [5,21,13]
3. The intensity of pain depends upon the *Madda* descending, as soon as the *Madda* descends, the pain also going to radiate towards lower part and up to fingers lastly [27].

USOOL E ILAJ AND ILAJ

Basically the treatment for any ailment is to restore the normalcy of the individual sufferer, irrespective of the cause of disease. In *Unani* system of medicine a well organised line of treatment is described for most of the ailments including *Amraze Mafasil*, out of which specifically for *Irqunna'sa*.

The usual method of treatment adopted by most of the ancient *Unani* physicians for the management of *Irqunna'sa*, is mentioned below:

1. ***Izlae sabab*** (Treat the cause) by adopting appropriate regimen
2. **Correction of *Sue Mizaj Maddi***
   a. *Ilaj bid Dawa*
      I. Single drugs
      ii. Compound drugs
   b. *Ilaj bit Tadbeer*
3. ***Istefragh of Ghalib Khilt*** [3]
   a. *Fasd* [14,25,34]
   b. *Hijamat Bil Shurt* [3]
   c. *Irsale Alaq* [3]
4. ***Amale Kai*** [1,6,35]
5. ***Imalae Mavad* through *Hijamat Bila Shurt***
6. ***Taskeene Alam***

***Ilaj bid Dawa* (Pharmacotherapy):** The treatment can be provided either by administering single or compound drugs. In this context *Unani* physicians have listed some important single drugs and their usage form,

such as:

- *Asale bladur* (Semicarpus anacardium) applied locally as *Tila*, mentioned by *Mohammed bin Zakaria Razi*, as it is an alternative of *Amale Kai* [3]
- *Khardal* 3 gm along with *Sharab* to be given regularly for 3 days [31]
- Local application of paste of *Pudina* and *Qust* [35]
- *Bozidaan*, *Suranjan*, *Gogul*, *Haleela Zard*, *Haleela Siyah*, *Raee*, *Sonth*, *Anesoon*, *Ajwaeen*, *Elva*, *Shaheme Hanzal*, *Kali zeeri*, *Farfiun*, *Majaith*, *Zoofae Khushk*, *Long*, *Pudina*,[36] *Ushq*, Jaosheer [23], *Parsiyoshan*, *Tukhme Karafs*, *Sakbeenaj*, *Turbud safaid* , *Anzaroot*, *Hulba*, *Beekhe Kibr* [30].

Compound drugs

- *Habbe Mushil*, *Habb Suranjan* [42], *Habb Zehab* [34], *Majoon Suranjan*, *Roghane Sana* [42]
- *Roghane Dafli*, *Roghane Surkh* [42], *Roghane Seer*, *Roghane Qurtum*, *Roghane Gule Aak*, *Roghane Malkangani* [40].
- According to *Ali Ibne Abbas Majoosi* following powder is found beneficial in cases of Sciatica; *Sanae Makki*-30gm, *Suranjan*-15gm, *Sheetraj Hindi*-11gm, *Zafran Khalis*-1.75gm, all the ingredients are pound to made powder and served along with sugar in equal quantity [35].

Ilaj Bit Tadbeer

- *Dalk* [3,25], *Takmeed* [1], *Nutool* [30], *Hijamat Bish Shurt* and *Hijamat Bila Shurt* [1,37,38,39] *Mahjama Nariya* (Fire cupping) [3,40,31,41] *Irsale Alaq* (leeching)[3], *Fasd* (Venesection), *Dalk* (Massage), *Amale Kai* [1,33,35].

Conclusion

The main purpose of this article is to make aware and update about the knowledge of ancient literature regarding *Irqun-Nasa* mentioned in classical Unani text, beginning from history, then their causes and pathophysiology from different classical books and lastly their management.

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ZIRCON (RED OXIDE OF LEAD): A VALUABLE GEMSTONE FROM *JAWAHARAT-I-TIS*' *A* HAVING MEDICINAL POTENTIAL IN PERSPECTIVE OF UNANI MEDICINE

Snober Khan[1], Mohd. Afsahul Kalam*[2], Bisma Ashraf[1], Mohammad Uvais[1], Toyiba Ibrahim[1] and Naureen Naqqash[1]

[1]PG Scholar (M.D), Department of Ilmul Advia, Regional Research Institute of Unani Medicine, Kashmir University, Habak, Naseembagh Campus, Hazratbal Srinagar, J&K, India
[2]Research Officer Unani, Regional Research institute of Unani Medicine, Kashmir University, Habak, Naseembagh Campus, Hazratbal Srinagar, J&K, India

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ABSTRACT

This comprehensive study is about a gemstone named as "Zircon".The study involves Zircon's vernacular names, identification, origin, acquisition, actions, properties, and its minerology etc. Zircon is a luminous stone derived from the Arabic words "*Zar*" and "*Gūn*" means Golden-coloured. It is a lustrous stone which is obtained from burnt lead. Historically Zircon has been esteemed among ancient gemstones. Besides its ornamental uses, it is used in capsule form, tablet form, as ointment, and in Sitz bath with fat and extract of *Plantago major* in Unani system of medicine as antiflatulent, cardiac tonic, and is used in Phlegmatic diseases, Wound healing, Skin disorders etc. So this study has been compiled to describe its medicinal uses in perspective of Unani system of medicine in detail.

No. of Pages: 4 **References: 5**

Keywords: Appetizer, Cardiac tonic, Gemstone, Phlegmatic diseases, Unani medicine, Wound healing, Zircon.

Introduction:

Zircon is a luminous stone derived from the Arabic words "*zar*" and "G*ūn*," means golden-coloured. Its English name, Zircon, is derived from the German word "Zirkon." It comes in various colours, ranging from light to deep hues. The red variety is known as *Aymar al-Rasis*. Pure *Gomed* another type is called as "*hyacinth*" or "*Gianth*", the brownish type as "*Zargūn*, which has further various colours like vermillion, deep red, and orange. The orange coloured is known as "Jacinth of France." Additionally, there is a white variety similar to white topaz. The yellow type of it resembles the yellow fat of cow's stomach that is why it is called as *Gomed* or *Gomedak*[1]The burnt residue of lead is called *Usranj* and method of making it involves burning lead until it turns red and then adding some salt. Sometimes, *Usranj* is made by burning *Asfida* (*Safeda Kashgharī*) as well. The process involves finely grinding *Asfidaj*, placing it in a deep vessel and igniting it, stire it with a wooden stick until it turns as red as *Hartāl* . Remove it from the fire and use it. In this way, *Usranj* is also known as

*Corresponding author: afsahnium@gmail.com

"*Hinduhas*" (Dioscorides). According to "Razi", when *Asfidaj* is burnt to an extent that its nature changes, it becomes *Usranj*.[2]

It is a *Saylqan*. The preparation process of which involves several steps. Initially, *Asfadaj* (*Safeda Kashghari*) is burned in a vessel, salt is then sprinkled over the burning substance, and the mixture is extinguished in vinegar. This results in the formation of a tablet. The portion of the material that remains intact is subjected to additional heating and is extinguished in vinegar once more, leading to the formation of another tablet[3]

Mutaradifat **(Vernacular Name):**

Andalusia:	*Usranj*[2]
Arabic:	*La'l Durr, Ahmar al-Rasas, Asriqun, Zarjūn Usranj*[2]
English:	Read lead and Zircon[1, 4]
French:	*Zircon*[1]
German:	*Zirkon*[1]
Greek:	*Surikun, Sailkon, Salīqūn, Saidofas*[2]
Hindi:	*Gomed, Gomed Manī, Ra Hortan*[5]
Latin:	*Syricum*[1]
Mineral name:	Read oxide of lead[2]
Persian:	*Zargūn*[1]
Punjabi:	*Gomed*[4]
Sanskrit:	*Gomedak*[4]
Syrian:	*Zargūn*[2]
Urdu:	*Gomia, Zargūn*[1]

Methodology

Numerous authentic publications were searched for the collection of this data (identification, types, therapeutic effects and pharmacological studies), on Zircon (Red Oxide of Lead). All the relevant articles were obtained from five Unani books published during 1982-2022. Appropriate Unani terminologies were taken from the Standard Unani Medical Terminology book published by the Central Council for Research in Unani Medicine in collaboration with the World Health Organization.

Shanakht, Mahiyat and Husul **(Identification, Nature and Acquisition):**

Zircon is a very lustrous stone which is obtained from burnt lead. It is a precious stone which is available in various colours like blue, yellow, orange, brown, green, red(Hyacinth) and colourless (crystalline). Exceeding diamond in volume and weight but closely resembles in appearance with it that is why it becomes difficult to distinguish between the two. Historically Zircon has been esteemed among ancient gemstones.[1]

Identification of Zircon involves rubbing it against wood to produce a gleam, real Zircon exhibits this, while imitation lacks the lustre. Another method involves observing its special color on a flame under microscope and is known as "French retain". If sprit is sprayed on it then it becomes colourless. Zircon can be identified based on weight and volume.[1]

It is often extracted in pencil like crystals from ores and the crystals are square shaped. Its length is 1cm approximately 1/3inches[4]. Zircon is found in many countries, including Pakistan, Australia, Brazil, Norway, Sri Lanka, France, and Thailand. The highest quality is considered to be in Sri Lankan, followed by African zircon. In India, it is found in the Himalayas, Kashmir, and southern regions. Although zircon obtained from Myanmar was once considered the most reliable, it is no longer available.

Zircon is also used in various industries. In the field of photography, it is significant in photographic smoke powders. Additionally, it is utilized in manufacturing spark plugs for motorcycles and various types of two-stroke engine[1]

Types:

It is of two types:

1. *Jarguns*: Superior quality with a light yellowish tint [4]
2. Hyacinth: This historical red and reddish brown stone is often found in Sri Lanka. [4]

Fig.1: Different types of Zirqun (Zircon).

***Mizaj* (Temperament)**: Cold and dry in 2nd degree[2]

***Miqdār* (Dosage):** 60mg[4]

***Nisbat-i-Sitāra* (Associated Star):** Mercury[1]

***Nafa' Khās* (Main action)**

The main actions of *Zircon* are, wound healing, used in Phlegmatic diseases, as a cardiac tonic and to alleviate digestion.[1]

***Af'āl* (Actions):**

It used in Flatulence. It increases appetite, digestion, alleviates palpitation and cardiac weakness, and enhances intellect. It is effective against phlegmatic diseases, jaundice, skin diseases, eye disorders, and cough. It has properties similar to Chandrakanta (moon stone).[5]

***Iste'mālāt* (uses):** It is used in case of Bell's palsy, hemiplegia, amnesia, insomnia, loss of libido, hypertension, stammering, syphilis, wounds, joint pain, leucorrhoea, leprosy and more. It is beneficial against fatal diseases and ulcers[1]. It generates warmth in body, aids blood circulation in stroke patients.[4]

Table 1:Showing indications of Zircon in various systemic diseases.

S. No	System	Indications
1.	Amrāḍ-i-Dimāgh wa A'sāb (Diseases of the CNS)	a. Badkhwābi (Insomnia): It positively impacts the human mind, reduces mental dryness, and promotes tranquillity. It is used in insomnia.[1] b. Nisyan (Dementia)[1] c. Falij wa Laqwa (Paralysis and bell's palsy)[1]
2.	Amrad-i-Dahan (Diseases of Mouth)	a. Luknat-i-Zaban (stammering)[1]
3.	Amrad-i-Qalb (Heart Diseases)	a. Ḍaght al-Dam Qawī(hypertension)[1]
4.	Amrad-i-MakhsusaMardāna (Male reproductive diseases)	a. Du'f-i-Bah (sexual weakness): It enhances sexual desire, eliminates impotence, and eradicates specific organ weakness.[1]
5.	Amrad-i-Niswān (Female reproductive diseases)	Saylān al-Rahim (Leucorrhoea)[1]
6.	Amrad-i-Mafāsi (Joint diseases)	Waja' al-Mafasil (Arthralgia)[1]

Minerology of Zircon: Chemical components found in zircon includes silica, zirconium, manganese, platinum, and calcium. Platinum content in zircon is higher than other elements, making it a reliable substitute for platinum. It is used in atomic technology, including reactors for atomic power plants. Zircon's hardness ranges from 6.5 to 7.5 on the Mohs scale, compared to diamond with a hardness of 10. In comparison to diamonds, zircon is 50 percent impure. Its weight can be estimated by considering that if a diamond of one carat has a certain weight, zircon of the same size will weigh approximately 1.5 carats. When heated with borax, it melts into a glass-like substance. Phosphorus is produced in it through heat. No effect of acid is seen on it [1]. The specific gravity is 4.70; refractive index 1.92 and melting point 3000 degrees.[4]

CONCLUSION

On the basis of above findings it is concluded that Zircon is a precious stone used in vast range of diseases in single form. It is one of the preferred drug to treat Phlegmatic diseases, used in wound healing, as cardiac tonic, antiflatulent etc. However, there are no scientific studies regarding its pharmacological properties, so this paper is compiled to highlight the hidden medicinal uses of this stone and further necessary pharmacological researches to validate its medicinal properties as mentioned by various Unani physicians.

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EFFICACY OF TUKHME SAMBHALU (VITEX NEGUNDU) IN POSTMENOPAUSAL SYNDROME (MULTAZIMA-BAAD-AZ-INQTAETAMS)- A RANDOMIZED PLACEBO CONTROLLED STUDY

Dr. Khan Bashayer[1], Dr. Tausif Khan*[2] and Dr. Rafi Ahmad Chaudhary[3]

[1]Assistant Professor, Dept. of Obstetrics & Gynecology,
[2]H.O.D and Assistant Professor, Dept. of Mahiyatul Amraz,
[3]Professor & HOD, Dept. of Obstetrics & Gynecology,
ZVM Unani Medical College & Hospital, Azam Campus Pune.

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ABSTRACT

Menopause means permanent cessation of menstruation at the end of reproductive life due to loss of ovarian follicular activity. It is the point of time when last and final menstruation occurs. The clinical diagnosis is confirmed following stoppage of menstruation (amenorrhoea) for twelve consecutive months without any other pathology. Postmenopausal syndrome is a common condition that affects women after menopause, characterized by symptoms such as hot flushes, sleep disturbances, mood swings, joint pain, and decreased quality of life. Unani physicians describe menopause under the term ihtibas-tamth (cessation of menstruation), correlating it with Sinn-i-Yaas, or the natural termination of menstruation. Vitex negundo (Tukhm-e-Sambhalu), an herb with potent estrogenic and therapeutic properties, has been historically used in Unani medicine to alleviate symptoms associated with menopause.This randomized placebo-controlled study evaluates the efficacy of Tukhm-e-Sambhalu in improving symptoms of postmenopausal syndrome. Thirty patients were administered the herb and compared to a control group receiving a placebo. The results showed significant improvement in hot flushes, sleep quality, mood, and joint discomfort in the test group, suggesting Tukhm-e-Sambhalu as a promising alternative treatment for managing postmenopausal symptoms in women.

No. of Pages: 4 **References: 18**

Keywords: Ihtibas-Tamth, Sinn-I-Yaas, Tukhm-E-Sambhalu, Multazima-Baad-Az- Inqtaetams.

Introduction:

With rising life expectancy, the number of postmenopausal women in India has grown, with many spending about a third of their lives in this stage. The average age of menopause in India is 47.5 years, with life expectancy at 71 years. Health concerns for menopausal women are increasing, and the number of menopausal women is expected to reach 103 million by 2026[1]. Menopause marks the permanent end of menstruation after 12 months of amenorrhoea. The most recent trend to treat the menopausal syndrome is symptomatic through hormone-based therapies. But these therapies have its limitations and not indicated for those patients having history of breast cancer, oestrogen

*Corresponding author: drtausifskhan@gmail.com

sensitive malignant conditions, uncontrolled hypertension, any liver disease, untreated endometrial hyperplasia etc [2-6]. The present scenario for advising hormone therapy is at minimal effective doses and for the shortest duration. With so much contraindication and many adverse effects of hormone therapy, medical fraternity seek efficient and safe drugs for the relief of menopausal syndrome. As progressively usage of herbal medicine is constantly increasing day by day, reportedly about one-third of the adult population used herbal medicine in the United Kingdom. Particularly women commonly use conventional medicine for menopausal syndrome as they feel safe or because of so much contraindication of hormone-based therapy [7].

In Unani system of medicine, there is no exact description of menopause but it has been discussed under ihtibas al-Tamth (cessation of menstruation) and can be correlated with Sinn-i-Yaas (age of natural termination of menstruation). Sinn-i-Yaas is the transition from reproductive to non-reproductive state usually achieved at the age of 50 years, sometimes at the age of 40 years too. Basics of Unani system divide human life into four stages which are as follows.

1. Sinn-I Namu (up to 30 years of age, Har Ratab Mizaj)
2. Sinn-I– Shabab (30-40 years of age, Har Yabis Mizaj)
3. Sinn-I– Kahulat (40-50 years of age, Barid Yabis Mizaj)
4. Sinn-i- Shaikhukhat-(above 50 years of age, Barid Yabis Mizaj).

Tabai Sinn-i-Yaas is attained at the age of 50 years, sometimes 60 years.

As menstruation usually stops at the age of 40-50 years, it comes under Sinn-i- Kahulat which is Barid Yabis in Mizaj (temperament). As Barid Yabis temperament is the quality of Khilt Sauda (black bile), we may infer that at this stage excess of Khilt Sauda developed in the body, makes less production of Ratubat Unsurya ultimately decreases the Hararat Unsurya and finally all Quwa (powers) of the body decreased[8-9] .In Unani System of Medicine there are so many herbs which have the properties of "Muqawwi Mufarreh Ada Raisa, "which can cure post-menopausal syndrome as mentioned in many ancient unani literature.Vitex negundo (Tukhm-e-Sambhalu), an herb with potent estrogenic and therapeutic properties, has been historically used in Unani medicine to alleviate symptoms associated with menopause[10-18].There for its seems very relevant to assess the efficacy of Tukhme Sambhalu (Vitex negundo) in managing postmenopausal syndrome (Multazima-Baad-Az-InqtaeTams), focusing on postmenopausal symptoms.

METHODOLOGY:

A randomized, placebo-controlled clinical study titled "Efficacy of Tukhme Sambhalu (Vitex Negundo) in Post Menopausal Syndrome (Multazima-Baad-Az-Inqtaetams)" was conducted at GNTC, Hyderabad. A total of 60 postmenopausal women were randomly assigned to either the test group (n=30), receiving 5 grams of Tukhme Sambhalu powder twice daily, or the control group (n=30), receiving roasted rice flour. Treatment lasted 12 weeks, with follow-ups on days 30, 60, and 90 to assess efficacy. Patients were assessed using the Menopausal Rating Scale (MRS), which covered somatic, psychological, and urogenital symptoms, along with laboratory investigations such as serum estradiol, FSH, and calcium levels. Ethical clearance was obtained, and the trial included a double-blind design to minimize potential bias, making the methodology comprehensive and scientifically sound. The inclusion criteria for the study involved women aged 40-55 years, experiencing symptoms associated with natural menopause (perimenopausal or postmenopausal periods) or surgical menopause. Women with stable conditions of diabetes and hypertension were also included, provided they were clinically stable. The study aimed to focus on women who were otherwise healthy but dealing with the

physiological changes related to menopause. The exclusion criteria ruled out women with malignancies, undiagnosed vaginal bleeding, and those with significant kidney, liver, or cardiac dysfunction. Additionally, patients with psychiatric disorders or any condition that could potentially interfere with the study outcomes were excluded. This clear differentiation ensured the study population was homogeneous and suitable for evaluating the effects of Tukhme Sambhalu on postmenopausal symptoms.

RESULTS:

1. **Symptom Improvement:**
   - Hot Flushes: The study drug, Tukhme Sambhalu, resolved 83.3% of cases, compared to 66.7% in the control group.
   - Sleep Problems: Improved in 33.3% of patients in the study group, while the control group showed 23.3% improvement.
   - Joint and Muscular Discomfort: Resolved in 26.7% of cases in the study group, with the control drug managing only 13.35%.
   - Anxiety: 80% of patients showed improvement with the study drug, compared to 53.3% in the control group.
   - Bladder Problems: Resolved in 86.7% of patients in the study group, whereas the control group showed improvement in only 33.3%.
2. **Laboratory Investigations:**
   - Serum Estrogen (Sr E2): The mean serum estrogen levels before treatment were 17.63 (±16.26) in the test group, which slightly increased to 18.43 (±15.88) post-treatment. In the control group, serum estrogen levels decreased from 20.93 (±13.94) to 19.13 (±13.54), indicating some benefit of the study drug on estrogen levels.
   - Serum FSH: The mean FSH levels slightly increased in both groups, with the test group showing a marginal rise from 72.6 to 73.2 and the control group from 64.59 to 68.13.
3. **Therapeutic Response:**
   - In the test group, 43.3% of patients experienced complete relief from symptoms, while 26.7% were partially relieved, and 30% showed no response.
   - In the control group, only 20% of patients were fully relieved, 36.7% showed partial relief, and 43.3% had no response.

These results show a statistically significant improvement in the efficacy of the study drug compared to the placebo in managing symptoms associated with post-menopausal syndrome.

DISCUSSION:

There was a highly significant improvement in reducing symptoms such as hot flushes, anxiety, bladder problems, joint and muscular discomfort, and physical and mental exertion. Tukhme Sambhalu showed superior efficacy in comparison to the placebo. For instance, it resolved 83.3% of cases of hot flushes in the study group, compared to 66.7% in the control group. Anxiety was relieved in 80% of patients in the test group, while the control group saw a relief rate of 53.3%. The drug also demonstrated a statistically significant improvement in managing bladder problems, with 86.7% of cases resolved in the study group compared to only 33.3% in the control group. Tukhme Sambhalu not only alleviated physical discomfort but also improved laboratory parameters such as serum estrogen (Sr E2) and FSH levels. Although the improvements in these hormone levels were modest, the clinical significance of the drug's effect on postmenopausal symptoms was evident, with a marked improvement in the overall quality of life for the participants. In conclusion, Tukhme Sambhalu is an effective and well-tolerated treatment option for postmenopausal symptoms, offering a natural and holistic approach that aligns with Unani medicine's principles.

CONCLUSION:

The conclusion of the study highlights the

positive outcomes of Tukhme Sambhalu (Vitex negundo) in managing postmenopausal syndrome. The research demonstrated that Tukhme Sambhalu was both safe and effective, particularly in reducing key symptoms like hot flushes, mood disturbances, and urogenital issues. A notable improvement was observed in patients' quality of life after three treatment cycles. In the test group, 43.3% of the patients experienced full relief from their symptoms, compared to only 20% in the control group. The study also found 26.7% of patients in the test group had partial relief, further supporting the efficacy of the treatment. The drugs used showed multiple therapeutic effects, including anti-inflammatory, laxative, and antidepressant properties, and were cost-effective with no significant side effects. Despite the promising findings, the study acknowledges limitations, such as a small sample size and short duration of therapy, and calls for further research with larger and more comprehensive trials to validate the results.

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EFFECTIVENESS OF *HABB-I-MUSAFFI KHUN* IN MANAGING *BUTHUR-I-LABANIYYA* (ACNE VULGARIS): A CASE STUDY

Ahtesham Ahamad[1]*, Mohammed Sheeraz Mushtaque Ahmed[2] and Sahiba[3]

[1]*PG Scholar (MD), Department of Moalajat
Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseem Bagh Campus, Hazratbal-190006, Jammu and Kashmir, India
[2]Research Officer Unani Scientist level 2 and Reader Department of Molajat Regional Research Institute of Unani Medicine, University of Kashmir,
[3]PG Scholar (MD), Department of Moalajat, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseem Bagh Campus, Hazratbal-190006, Jammu and Kashmir, India

Case Report

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ABSTRACT

Acne Vulgaris (AV) is one of the most common skin disorders worldwide, impacting individuals across all races and ethnicities and primarily affecting the pilosebaceous glands. It is caused by excessive sebum production, thickening of the skin, and the growth of *Propionibacterium acnes* bacteria. The condition predominantly affects adolescents, with approximately 80% of teenagers diagnosed and around 85% of young people experiencing some form of acne. While it typically emerges during puberty, it can also occur in individuals up to 25 years or older, with males generally experiencing more severe cases. In Unani medicine, *Buthur-i- Labaniyya* is identified as small white spots on the nose and cheeks that resemble drops of milk. The principles of treatment (*Usul-i-'Ilaj*) focus on the *Istifragh* (evacuation) of phlegm from the body and brain, alongside the use of *Mufattih* (deobstruent), *Jali* (detergent), and *Muhallil* (resolvent) medications. This case study reports on a 28 year old female patient suffering from AV who had not previously received treatment. She was administered *Habb-i-MufaffiKhun* (HMK), two tablets twice daily, over four-week period. The patient exhibited significant improvement in her acne symptoms, highlighting the effectiveness of Unani formulation in managing this common condition. This study aims to underscore the potential of Unani medicine in treating Acne Vulgaris.

No. of Pages: 6 **References: 22**

Keywords: Acne Vulgaris, Buthur-i-Labaniyya, Habb-i-MusaffiKhun, Unani Medicine.

Introduction:

Acne Vulgaris is a chronic inflammatory disorder of the pilosebaceous units.[1] In dermatological literature, adult female acne is considered as an inflammatory skin condition determined by multiple factors, which may or may not involve hyperandrogenism.[2] Clinical manifestations of acne include open and closed non-inflammatory comedones, as well as varying degrees of inflammatory lesions such as papules, pustules,

*Corresponding author: *drsheerazmd@gmail.com*

and nodules. The most commonly affected areas are the face, back, and chest. Post-inflammatory macules, pigment alterations, and scarring are frequently observed. Follicular plugging, or comedones, obstructs the drainage of sebum, while androgens stimulate the sebaceous glands to produce excess sebum. Bacterial lipase breaks down lipids into fatty acids, generating pro-inflammatory mediators that trigger an inflammatory response. When the walls of the distended follicles rupture, sebum, lipids, fatty acids, keratin, and bacteria infiltrate the dermis, provoking an inflammatory and foreign-body reaction. This intense inflammation can result in scarring.[3,4] Acne is a polymorphic condition primarily affecting the face (99%), with lesser involvement of the back (60%) and chest (15%). Although it predominantly occurs in adolescents, it also affects 8% of individuals aged 25 to 34 and 3% of those aged 30 to 44.[5,6]

AV is known in Hindi as Muhasah and in Persian as Rukharah, along with other synonyms such as Buthur-i-Labaniyya, Habb al-Shabab, and Buthur Duhniyya.[7] In Unani, AV is referred to as Buthur-i-Labaniyya, where Buthur refers to an eruption and Labaniyya means milky. Ibn Sina described Buthur-i-Labaniyyaas small, white eruptions that appear on the nose and cheeks, resembling condensed drops of milk.[8] A'zamKhan and Tabri noted that this condition is characterized by whitish eruptions on the face and cheeks, likened to Nuqta-i-Shir (drops of milk). When pressed, these eruptions release an oily secretion resembling Ravghan-i-Zard (clarified butter). Buthur-i-Labaniyya typically occurs around puberty. Zakariya Razi introduced a specific type of eruption called Atiasus, which consists of small, dry rashes on the face that are hard in consistency and chronic in nature.[9,10] This condition is classified as Mu'tadi (infectious) and is marked by white lesions on the face, nose, and cheeks; when squeezed, they release a cheesy substance. Ahmad bin Tabri referred to Buthur-i-Labaniyya as Zizan, which appears on the face.[9]

In the Unani System of Medicine, various Mufrad (single) and Murakkab (compound) medications have been used to treat Buthur Labaniyya. These treatments are considered safe and do not typically cause significant side effects. Medications with Jali (detergent), Muhallil (resolvent), Muhaffi-i-Dam (blood purifier), and Mujaffif (desiccative) properties are employed in the treatment of Buthur Labaniyya.[11] This case study highlights the effectiveness of Unani formulation for treating AV.

MATERIAL AND METHODS

Case Report

A 28-year-old female patient suffering from Acne Vulgaris for one year presented at the OPD of RRIUM in Srinagar, complaining of painful eruptions primarily on her cheeks. Her menstrual history indicated irregular cycles over the past year, and she has not been pregnant. There was no family history of Acne Vulgaris, and she had not sought treatment for her condition. A dermatological examination revealed multiple papulopustular lesions on her face. Under magnification, a few blackhead and whitehead comedones—key features of Acne Vulgaris—were also observed. The severity of her acne was assessed by Investigator Global Assessment Scale (IGAS) by US Food and Drug Administration(FDA).[12] (Table 1).

A comprehensive history indicates that the patient experienced a gradual increase in weight. A dietary habit consisting of junk food, coupled with a sedentary lifestyle, has contributed to the exacerbation of the disease. During the general physical examination, the patient appeared to be in good health, weighing 60 kg and measuring 154 cm in height. All vital signs were normal. She agreed to participate in the study after providing written informed consent.

Table 1: IGASby US FDA.

Grade	Clinical description
0	Clear skin with no inflammatory or noninflammatory lesions
1	Almost clear; rare noninflammatory lesions with more than one small inflammatory lesion
2	Mild severity; greater than grade 1; some noninflammatory lesions with no more than a few inflammatory lesions (papules/pustules only, no nodular lesions)
3	Moderate severity; greater than grade 2; up to many noninflammatory lesions and may have some inflammatory lesions, but no more than one small nodular lesion
4	Severe; greater than grade 3; up to many noninflammatory and inflammatory lesions, but no more than a few nodular lesions

Assessment was done using the IGAS by US FDA prior to treatment. After evaluating the patient, it was determined that she had grade 2 AV, characterized by the presence of papules and comedones, with no nodules or cysts observed on the patient's face.

Intervention and follow-up

The patient was treated following the principles mentioned in classical texts of Unani Medicine. The Unani drug HMK[13] was obtained from RRIUM Hospital dispensary and administered as two tablets twice daily for four-week period. The ingredients of HMK included *Bakayin* (*Melia azedarach), Barg-i-Nim* (*Azadirachta indica)* 5 g each; (*Lawsonia inermis),Barg-i-Henna* (*Lawsonia inermis)* 2 g; *Sandalsurkh* (*Pterocarpus santalinus)*, *Brahamdandi* (*Tricholepis glaberrima)*, *Halela Zard* (*Terminalia chebula)*, *Chaksu* (*Cassia absus)*, *Sarphoka* (*Tephrosia purpurea* L.), *Shahtra* (*Fumaria indica)*, *Kishneez Khushk* (*Coriander sativum L)*, *Neelkanthi* (*Ajuga bracteosa)*, *SadalSafed* (*Santalum album* L.), *Gul-i-Surkh* (*Rosa damascene* Mill) each 3 g, *FilfilSiyah*,(*Piper nigrum* L.),Zeera Safed *Cuminum cyminum*, *Kachnal* (*Bauhinia racemosa* Lam)each 1 g. The patient was followed every 15 days, and photographs were taken before and after treatment. The patient was advised to avoid cold, salty, sour, fermented, and spicy foods while also maintaining a stress-free lifestyle. As a result of the treatment at the end of 4 weeks, improvement was noted as Grade 0; the number of eruptions on the face diminished in number, and the skin appeared nearly clear. No adverse effects were reported during the treatment.

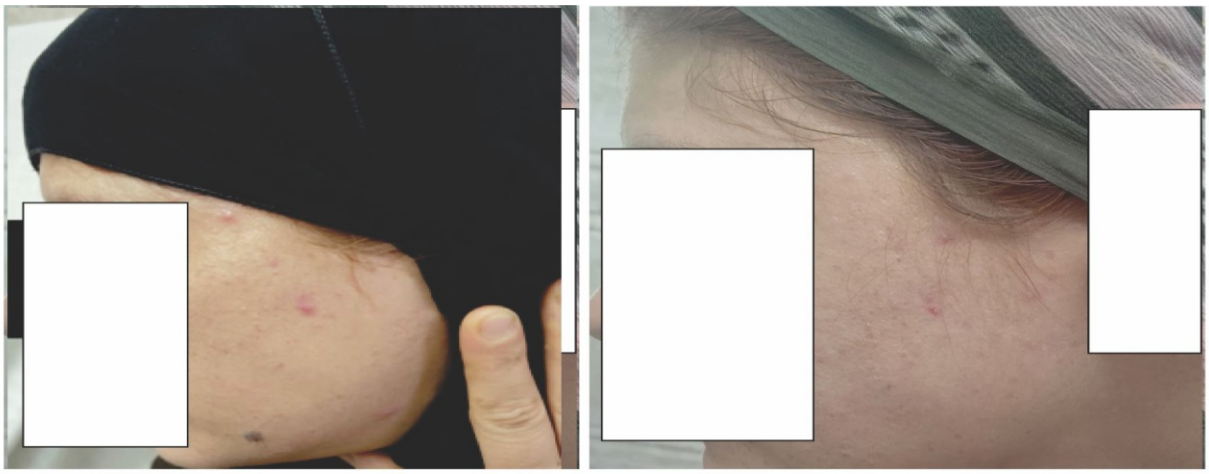
DISCUSSION

Patient's improvement might be a result of the pharmacological properties of the ingredients in HMK. HMK includes *Bakayin* (*Melia azedarach*), recognized for its therapeutic benefits such as antibacterial, fungicidal, antiulcer, antipyretic, anticancer, and wound-healing properties.[14] *Barg-i-Nim* is valued in Unani medicine for its blood-purifying and antibacterial effects. Research on *T. chebula* extracts has highlighted their antibacterial properties, antioxidant activity, inhibition of lipid peroxidation, and suppression of superoxide radicals. [15] A study by Keshavarz *et al*. (2016) noted *Henna's* anti-inflammatory, antimicrobial, antibacterial, antifungal, and immune-modulatory properties.[16] *Tephrosia purpurea* demonstrates antiulcer, antioxidant, wound healing, antiviral, analgesic, anti-inflammatory, antimicrobial, mast cell stabilizing, cytotoxic, and antipyretic activities.[17]Nisar Ahmad *et al*. (2012) reported various biological activities associated with *Piper nigrum*, including antibacterial, antifungal, analgesic, anti-inflammatory, antimutagenic,

anti-metastatic, antioxidative, and immunomodulatory effects.[18]Research by Khare *et al*. (2020) on *Tricholepis glaberrima* highlights its effectiveness against fungal infections and inflammation.[19]*Bauhinia racemosa* Lam. exhibits a wide range of therapeutic properties, including antibacterial, antifungal, anti-inflammatory, antioxidant, analgesic, anti-ulcer, and anticancer activities.[20]Research by Akriti *et al*. (2011) on *Ajuga bracteosa* revealed its anti-inflammatory effects, cytotoxicity against KB cell cultures, and antibacterial activity against gram-positive bacteria.[21]*Santalum album* displays diverse benefits, including anti-inflammatory, anti-mitotic, antiviral, anticancer, anti-ulcer, antifungal, and antibacterial properties.[22]

RESULT

The significant changes in acne before and after treatment are shown in Figures 1 and 2.



Note: These pictures were taken in the same location under similar lighting conditions, capturing the lateral side of the face (OPD of RRIUM, Srinagar).

CONCLUSION

This case report illustrates the positive outcomes of using HMK for the treatment of AV. AV is a common dermatological condition characterized by comedones, papules, and pustules, often resulting from hormonal fluctuations, excess sebum production, and inflammation. The patient showed significant improvement over the four-week treatment period, with a notable decrease in lesions and clearer skin. These results indicate that HMK is safe and effective for treating AV and showed a remarkable response. The trial requires the study on large sample size with more subjective and objective parameters, safety parameters, efficacy parameters after proper ethical clearance.This study aims to reflect only symptomatic reliefto the case.

Abbreviations: AV (Acne Vulgaris), HMK (*Habb-i-Musaffi Khun*), IGAS (Investigater Global Assessament Scale), FDA (Food And Drug Administration)

Compliance with ethical standards:

Declaration of patient consent:

The patient provided written inormed consent about her case that the author can use the study outcomes, her photographs for publication in the Scientific journal and for official and research purposes. In the consent form, she agreed to report herself for clinical information in a scientific context. She acknowledged that her name and initials would remain confidential, and efforts would be made to protect her identity.

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Conflict of Interest: There is no any conflict of interest.

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THERAPEUTIC APPROACHES FOR MELASMA (*KALAF*) IN UNANI MEDICINE

Nushrat Jahan[1], Yasmeen Shamsi*[2], Md. Wasi Akhtar[3] and Lubna Fatima[4]

[1]MD (Scholar), Department of Moalajat, SUMER, Jamia Hamdard, New Delhi
[2]Professor, Department of Moalajat, SUMER, Jamia Hamdard, New Delhi
[3]Assistant Professor, Department of Moalajat, SUMER, Jamia Hamdard, New Delhi
[4]Research Officer, CCRUM, Ministry of Ayush, Govt. of India, New Delhi

Review Paper

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ABSTRACT

Melasma, known as "*Kalaf*" in Unani medicine, is a common acquired pigmentary disorder mostly affecting the face. It is much more common in women during their reproductive years but about 10% of the cases do occur in men. Melasma appears as symmetrically located irregular macules and patches that range from light brown to dark brown in colour. The three predominant facial patterns are centrofacial (forehead, nose, upper lip), malar (malar cheeks), and mandibular. Unani physicians *Ibn Sina, Ibn Hubal Baghdadi, and Rabban Tabri* have discussed melasma in detail. According to Unani System of Medicine, melasma results from the accumulation of black bile (*Sawda*) within the skin.

Conventional treatments like UV protection, topical medicines, and chemical peels are effective, but short lived and associated with unwanted side effects. Therefore, development of effective and safe products for melasma is becoming emergent. Treatment in Unani medicine typically involves a combination of dietary and lifestyle modifications, herbal remedies, and therapeutic procedures (*Ilaj-bit-Tadbeer*) to restore balance of *Akhlat* (humours) and eliminate the accumulated *Sawda*.

No. of Pages: 7 **References: 29**

Keywords: Melasma, *Kalaf*, Chloasma, Unani Medicine, Sawda.

Introduction:

Melasma is the most common pigmentary disorder among Indians. It is much more common in women during their reproductive years but about 10% of the cases do occur in men Melasma is an acquired pigmentary condition primarily affecting the face of women (1,2). The word "melasma" originates from the Greek term "*melas*," meaning black. It typically appears as symmetrically located irregular macules and patches ranging from light brown to dark brown in colour (3). These patches predominantly develop on the face, with less frequent occurrence on the neck and forearms. Conventional treatments for melasma include UV protection, topical medications, oral therapies, chemical peels, LASER sessions, and light-based therapies. Despite its global impact, conventional treatment options often entail potential side effects and limitations, necessitating the search for alternative therapeutic strategies (4–8). For example, repeated applications of hydroquinone, commonly used for the treatment of hyperpigmentation, can cause toxic reactions, depigmentation, vitiligo-like hypochromia, or

*Corresponding author: yasmeenshamsi@yahoo.co.in

leukodermam(9). Therefore, development of effective and safe products for melasma is becoming emergent. Unani medicine offers valuable insights for managing melasma holistically.

Etiopathogenesis:
The etiopathogenesis of melasma includes genetic influences, chronic exposure to UV radiation, and hormonal stimulation. However, melasma is not the same skin hyperpigmentation as that induced by UV irradiation or inflammation. Nevertheless, there are similarities between the histopathologic presentation of melasma and solar elastosis, a hallmark of photo-aged skin. These overlaps include altered basement membrane, increased vascularization, and increased mast cell count. Previously, increased melanogenesis was thought to be the sole contributing factor to the pathogenesis of melasma but more recently, aberrant vasodilation and angiogenesis have been found to play a role. Nitric oxide, a potent vasodilator, was found to be overexpressed at the dermal-epidermal junction and was hypothesized to contribute to melasma through stimulation of tyrosinase and increasing vascularity(10).

Classification:
Melasma is classified both clinically and histologically. The clinical and histological features of melasma in men are the same as those of melasma in women (11,12). Clinically, melasma occurs in three distributions as:

1. *Centro-facial Pattern*:
   In this pattern, melasma affects the forehead, nose, and upper lip (excluding the philtrum, cheeks, and chin).

2. *Malar Pattern*:
   When appearance of melasma is restricted to the malar cheeks.

3. *Mandibular Pattern*:
   When melasma affects only the jawline, it is called Mandibular Pattern.

Histologically, melasma is divided into four patterns of pigmentation; epidermal, dermal, mixed, and indeterminate. The epidermal type consists of melanin deposition in the basal and suprabasal layers of the epidermis. The epidermal lesions usually appear light brown in colour under normal light, but under Wood's light examination, colour contrast of lesioned skin is enhanced. The dermal type involves the superficial and mid dermis. Colour contrast is not enhanced under Wood's light examination in the dermal type. These lesions are often grey or bluish grey under normal light. Melanin deposition in both the epidermis and dermis constitutes the mixed type. There is enhancement of colour contrast in some areas of lesioned skin, while not in others, in Wood's light examination of the mixed type. The mixed type is usually a deep brown colour under normal light. A fourth type is found in patients of dark skin. Under normal light, lesions may be ashen grey, although they can be difficult to recognize. Lesions are not apparent on Wood's light examination because of the lack of contrast. Histologically, melanin deposition is found primarily in the dermis (13).

Etiopathogenesis in Unani medicine:
Unani medicine, melasma is referred to as "*Kalaf*" and is described as a blackish patch formed by the merger of numerous small black spots known as "*Barash*." In classical Unani medical texts, "*Kalaf*," is often discussed with detailed descriptions of its etiology and pathogenesis. Unani scholars consider *Kalaf* a melancholic (*Sawdawi*) disease, which arises due to the accumulation of black bile (*Sawda*) in the skin, resulting from leakage of microvasculature. This condition is often associated with melancholy disorders of the liver and spleen, leading to a predominance of black bile (*Ghalba-e-Sawda*) in the blood.

Unani Physicians Ibn Sina, Ibn Hubal Baghdadi, and Rabban Tabri, have discussed melasma in their renowned books. According to them, melasma results from the accumulation of black bile (Sawda) within the skin. The classical Unani

text "*Kitab-Al-Mukhtarat-Fil-Tibb*" by Ibn-Hubul-Baghdadi, explains that the macular lesions of Kalaf are formed due to the accumulation of morbid matter in the blood vessels under the skin. The body's defense mechanisms are not capable of dissolving and absorbing these accumulated substances, leading to visible hyperpigmentation(14). The classical text *Ghina Muna* suggests that *Kalaf* is caused by the gases (*Bukharat*) spread out from the stomach and accumulate under the facial skin. It also mentions that *Kalaf* is common in pregnant women due to the cessation of the menstrual cycle, which results in the accumulation of morbid matter within the body.

Types of Kalaf (melasma) in Unani medicine

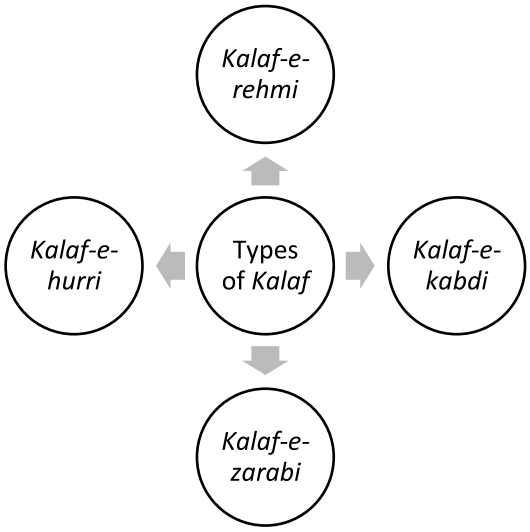
The classical Unani literature mentions various forms of melasma as under

- *Kalaf-e-rehmi*:
  When melasma occurs due to hormonal imbalance brought on by pregnancy

- *Kalaf-e-kabdi*:
  This type of melasma is related to liver dysfunction

- *Kalaf-e-zarabi*:
  When melasma is caused by any damage or abrasion to the facial skin's microvasculature

- *Kalaf-e-hurri*:
  When melasma is caused by excessive sun exposure



Management of *Kalaf* (melasma) in Unani system of medicine

Unani medicine is a comprehensive system of healing that integrates the principles of natural medicine, emphasizing balance and harmony within the body. It is based on the humoral theory, which proposes that health is maintained by the balance of four humors: blood (*Dam*), phlegm (*Balgham*), yellow bile (*Safra*), and black bile (*Sawda*). Imbalances in these humors lead to a disease, and the goal of Unani treatment is to restore balance through natural remedies, diet, and lifestyle modifications (15).

Unani medicine employs a holistic approach to managing melasma, focusing on both internal and external therapies to restore balance and promote healthy skin.

Treatment approaches in Unani medicine for melasma include *Ilaj b'il Ghiza* (Dietotherapy), *Ilaj bi'l Tadbir* (Regimenal therapy), *Ilaj bi'l Dawa* (Pharmacotherapy), *Ilaj-i Nafsani* (Psychotherapy).

1. *Ilaj b'il Ghiza* (Diet-therapy):
   It emphasizes dietary modifications to balance humors and improve skin health.

2. *Ilaj bi'l Tadbir* (Regimenal therapy):
   This method focuses on lifestyle adjustments, such as sun protection, stress management, and maintaining a healthy routine.

3. *Ilaj bi'l Dawa* (Pharmacotherapy):
   It utilizes single herbal drugs and/or their formulations to address melasma.

4. *Ilaj-i Nafsani* (Psychotherapy):
   It recognizes the impact of psychological factors on skin health and aims to address stress and emotional well-being.

Unani System of Medicine emphasizes the importance of maintaining a balanced diet and lifestyle to prevent the accumulation of black bile (*Sawda*), which is believed to cause melasma. Additionally, stress management is advised to maintain overall health and hormonal balance.

These holistic approaches aim to mitigate melasma effectively. Hence, Unani physicians employ a multifaceted approach that encompasses risk factor modifications, '*Ilaj b'il Ghiza wa Tadbir* (diet and regimen therapy), '*Ilaj bi'l Dawa* (pharmacotherapy), and *Ilaj-i Nafsani* (psychotherapy).

I

1.Risk factor modification:

In Unani medicine, modifying risk factors is essential for managing melasma (*Kalaf*). As UV rays can worsen the condition, the foremost recommendations include reducing excessive sun exposure. Treating underlying stomach issues and addressing irregular menstruation in women are also critical steps.

2.Ilaj b'il ghiza (dietotherapy):

Dietotherapy has a significant role in maintaining the balance of humors within the body. Special attention is given to the choice of foods, their preparation, and the timing of meals to promote overall health and harmony. The best prescribed diet for melasma is *Ma' al-Jubn* (whey) which has immense benefits in treating melasma. Foods that balance *Safra* and *Sawda*, such as fresh fruits, vegetables, and dairy products, should be included in the diet. Drinking plenty of water helps to flush out toxins and maintain healthy skin. Conversely, certain foods that increase the production of *Safra* and *Sawda*, such as spicy, fried, processed foods, salted and smoked fish, mushrooms, beef, cabbage, and prolonged use of eggs need to be restricted or avoided.

3. Ilaj bi'l dawa (pharmacotherapy):

In Unani system of medicine, *Ilaj bil Dawa* (pharmacotherapy) refers to the use of natural herbs and their formulations to treat underlying imbalances and bring the body humours back into balance. *Tanqiya-i-Sawda* (evacuation of black bile) is the first therapeutic method that Unani physicians have advocated for controlling melasma. This involves use of *Munzijat* (purgatives) and *Mushilat* (laxatives) that specifically target *Sawda* (Black bile).

The second one is *Taqwiyat-i Mi'da*, which involves use of medicines to strengthen the stomach, and the third one is *Tasfiya-i-jild*, which is cleansing the skin with those medicines having *Jali* (detergent) properties.

Additionally, , medicines having *Muhalil* (anti-inflammatory) properties are used. The commonly used herbs in the treatment of *Kalaf* (melasma) are delineated in Table 1.

Table 1: Some important Herbs used in the treatment of Melasma.

S.No	Unani Name	Scientific Name	Chemical Constituents	Mode of Action	Reference
1.	*Emblica Officinalis*	Amla	Emblicanin & Punigluconin Pedunculagin	Antioxidant Tyrosinase inhibition	(18)
2.	*Curcuma longa*	Haldi	Curcumin, Demethoxycurcumin, Bisdemethoxycurcumin, Diacetyl curcumin	Anti-inflammatory, Antioxidant	(19)
3.	*Crocus sativus*	Zafran	α β carotenes & Cyanidins Kaempferol	Antioxidant Tyrosinase inhibitor	(20)
4.	*Santalum album*	Sandal	α santalo	Tyrosinase inhibition	(21)
5.	*Aloe barbadensis*	Elva	Aleosin	Tyrosinase inhibition, antioxidant	(22)
6.	*Saussurea lappa*	Qust	Methanolic extract	Tyrosinase inhibition	(23)

7.	*Azadirachta indica*	Neem	Methanolic extract	Tyrosinase inhibition Antifungal	(24)
8.	Masoor	*Lens culinaris*	Vit-E,beta cartotene, Phytosterol	Anti-inflammatory	(25)
9.	Anjeer	*Ficus carica*	ABTS [2,2-azinobis-(3-ethylbenzothiazoline-6-sulfonate)] and DPPH (1,1-diphenyl-2-picrylhydrazyl)	Antioxidant	(26–28)
10.	Badam Talkh	*Prunus Amygdalus amara*)	amandine	Inhibit melanogenesis Antioxidant	(29)

4. Ilaj bi'l tadbir (regimenal therapies):
Regimenal therapy involves various techniques to cleanse and detoxify the body, promoting overall health and well-being. The fundamental idea behind Unani therapy for the treatment of chronic illnesses, such as Kalaf (melasma), is Tanqiya-i Mawad (expulsion of unhealthy stuff). A sequence of systemic procedures is used to eliminate harmful humours from the body. Some of these are: Ishal (purgation), Fasd (venesection), Hijama (cupping), Irsal-i 'Alaq (leeching), Huqna (enema), Ta'riq (diaphoresis), Idrar (diuresis), Hammam (Turkish bath), Riyazat (exercise) and Dalk (massage).

5. Ilaj-i nafsani (psychotherapy):
Unani medicine recognizes the impact of mental and emotional health on physical well-being therefore psychotherapy forms and integral part of Unani treatment acknowledging the strong connection between the mind and body. Stress and anxiety can exacerbate melasma, so psychotherapy and stress management techniques are important components of treatment. Stress management techniques, counselling, and relaxation practices are often incorporated to promote emotional well-being and enhance the overall healing process.

CONCLUSION

An invaluable viewpoint on the etiopathogenesis and therapeutic modalities of melasma is provided by Unani system of medicine. Unani system of medicine's customized, holistic approach holds great promise for treating melasma since it emphasizes natural treatments, treating underlying causes, and changing lifestyle choices. People's focus has already shifted to the Unani medical system due to the negative impacts of contemporary treatment. By proving the Unani medical system's efficacy in treating a range of illnesses, it is imperative to foster public acceptance and understanding of the system and foster faith in it. Appropriate scientific research, data transparency, community involvement, and patient education can all help achieve this. Melasma can be effectively managed with the use of Unani medicine, which employs herbs and medications having black bile evacuation (Tanqiya-i Sawda), anti-inflammatory (Muhallil), and detergent (Jali) properties.

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A COMPREHENSIVE REVIEW OF *NAR FARSI* (ECZEMA)

Nadeem Iqbal[1], Mohammad Anzar Husain[2], Altaf Hussain Shah[3] and Syed Mohd. Abbas Zaidi[4]

[1]PG Scholar, Department of Amraz-e-Jild Wa Tazeeniyat, HSZH GUMC Bhopal, (MP)
[2]Professor & HOD, Department of Amraz-e-Jild Wa Tazeeniyat, HSZH GUMC Bhopal, (MP)
[3]Assistant Professor, Department of Mahiyatul Amraz, HSZH GUMC Bhopal, (MP)
[4]Assistant Professor, Department of Moalajat, HSZH GUMC Bhopal, (MP)

Review Paper

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ABSTRACT

Eczema (*Nar Farsi*) is a very common skin inflammatory disorder, which is characterized by Itching, Dryness, Erythema, Edema, Exudation, Excoriation and Lichenification. It is type of dermatitis in which inflammation of the epidermis occurs. It does not have a known specific etiology. Diagnosis of eczema is made clinically by Hannifin and Rajka's criteria. It is caused by excess production of abnormal *Safra* (yellow bile), *Sauda* (black bile) *& Mutaharriq sauda* (burn black bile). Nar Farsi is *Persian* term, means "Fire of *Persia*", it indicates the burning symptoms related to this disease. It affects 2-3% of the world's population. In conventional medicine eczema is generally treated with topical and systemic steroids, emollients and oral anti-histaminic drugs, which is also limited due to its side effects. This leads us to look forward for alternative, safe and effective option to treat eczema. Unani system of Medicine is very ancient and rich system of medicine. The ancient Unani Physicians described the management of eczema in details in Classical Unani Literature.

The aim of this review paper is to find out brief description of Eczema alongside its etiological introduction, classification, clinical features, investigations, differential diagnosis, diagnosis, complications and management in Unani and modern medicine and to find out the possible treatment of Eczema as mentioned in classical Unani literature which are safe and effective in the treatment.

No. of Pages: 7 **References: 29**

Keywords: Eczema, *Chajjan*, Unani medicine, Dermatitis.

Introduction:

Eczema (*Nar-Farsi*) is defined in modern dermatology textbooks as an inflammatory skin reaction to many substances, exhibiting erythema, oedema, vesiculation, crusting, and lichenification.[8] Patients' social functioning and sleep habits are impacted by pruritus and skin lesions, and ugly skin lesions may cause patients to become socially isolated. The condition affects the patient's quality of life.[9,10] As eczema has no known cure, treatment aims to control symptoms by reducing inflammation and relieving itching. Topical corticosteroids are used as part of conventional treatment for eczema, while emollients or moisturizers are used to treat dry skin.[11]

Eczema is known by several names in the Unani medical system, including *Chajjan*, *Akota* and *Nar-Farsi*[1] which is the most frequent and

*Corresponding author: *iqbal.nadeem76@gmail.com*

ancient skin illnesses. The word " *Nar-Farsi* " was first used in Persia, or the person who used it was a resident of Persia and it was associated with severe itching and burning.[2]

According to a renowned Unani physician *Hakim Kabiruddin*, Eczema is a skin disorder in which the affected person experiences scorching sensations over the lesions, similar to what occurs when something gets fire.[3]The great expert in Unani medicine, *Ghulam Jilani*, defined Eczema as a skin condition that causes the lesion to burn as if it were on fire.[4] According to *Abul Mansoor al Hasan al Qamri*, Eczema is a form of itching that is followed by an unbearable burning sensation, later blisters that contain fluid emerge.[5] *Ahamad Alhasam Jirjani*, An Unani physician, defined Eczema as a skin illness in his book *Zakhira Khwarzam Shahi*, where liquid-filled vesicles develop and cause painful burning and itching sensations.[6]

Eczema is derived from the Greek phrase "to boil out" (zema=boil, ec=out), since the skin becomes seeping or boiling in eczema.[7]

A well-known dermatological condition since the Greco-Arab time is Eczema. In addition to discussing the natural structure and functioning of the skin, Unani physicians also discussed the causes (*Asbaab*), patho pathophysiology (*Maahiyat*), types (*Aqsaam*), clinical manifestations (*Alamat*), therapeutic options (*Usool-e-Ilaaj*), and management (*Ilaaj*) of Eczema.[13,14]

Conventional treatment for Eczema includes systemic corticosteroids such as methotrexate, cyclosporin, and UV light therapy have been associated with a number of side effects, such as skin atrophy, hair loss, weight gain, glaucoma, cataract, high blood pressure, osteoporosis, irregular menses, nephrotoxicity, and hepatotoxicity of the liver.[12] Eczema has been treated with a variety of single and compound medications and regimens in the Unani medical system since the Greco-Arab era.[15,5,16] Numerous skin conditions can be successfully treated by the Unani medical system. Therefore, this review study aims to address Eczema and Unani medications that have been found to be useful in treatment.[17]

Synonyms: *Nar-Farsi, Chhajan, Akota*

Epidemiology and prevalence:
All around the world, dermatitis is a prevalent issue. Between 2 and 3 percent of all medical issues seen in practice are related to it. Even with all the misconceptions, the two names dermatitis and Eczema are being used similarly, that's why they are combined together. Successfully diagnosing dermatitis and eczema clinically is the first step in dermatological practice.[7]

The term "Eczema" is derived from the Greek word "boiling," which defines the microscopic vesicles, or bubbles, that are frequently observed during the early acute phases of the condition but less frequently during its later chronic phases. Since dermatitis refers to inflammation of the skin, it is technically a more general term than eczema, which is only one kind of skin inflammation among many.[18]

During the latter part of the 20th century, there was a significant rise in the occurrence of atopic dermatitis, asthma, and allergic rhino-conjunctivitis, which resulted in a significant health issue in several nations.[19]

Etiology in Unani Medicine and Modern Medicine

Unani Scholars	Etiology
Ghulam Jilani[4]	Dyspepsia, Zoaf-e-asab, Niqras , Deedan-e-aama, Excessive heat, Extreme cold
Ismail Jurjani[20]	Ghalba wa hiddat khoon
Kauser Chandpuri[21]	Ghalba-e-safra , Kami sauda
Ali Ibn Majoosi[22]	Damvi madda
Abi Ibn Saddiq[3]	Dentition in children, Zoaf-e-aam, Zoaf-e-asab, Niqras, Waja ul mafasil, Deedan-e-aama, Amraz-e-meda
According to contemporary medicine [7,18	Exposure to irritants, Allergic or sensitive skin

The development of Atopic Dermatitis was formerly thought to be significantly influenced by IgE-mediated early and late phase responses. Current research indicates that the pathophysiology of Atopic Dermatitis, which includes the overproduction of IgE, may be caused by a variation between the Th1 and Th2 subsets of T helper cells.[23,24]

Pathophysiology:
Unani doctors say that " Eczema " is a skin condition that manifests as peacock-shaped linear flames of fire and rashes at the site of lesions. In addition to discomfort and intense itching, vesicles (*Muratab dane*) appear over time.[13] These vesicles eventually collapsed, broken and became dry until crust development and lichenification occurred.[21] There may be an inflammatory infiltration and varying degrees of dermal vasodilatation, depending on the type of eczema, they could change. Although the pathophysiology of endogenous eczema is still unclear, that of exogenous eczema, especially initial irritant and allergic contact dermatitis, is well known.[25]

Types of Eczema:
The following forms of eczema have been classified by ancient Unani Scholars.[13,14]

Depending on the shapes and discharges of the lesions:
Nar-Farsi Sada
Nar-Farsi Ahmar (*Surkhi mael*)
Nar-Farsi Naffati (*Abladari*)
Nar-Farsi Mutaqaiyah (*Peepdari)*
Nar-Farsi Sulb (The skin's hardness at the leison location)
*Nar-Farsi Shaqaqi (*skin cracking at the leison location)

Clinically it is divided in the following types:[18]
Acute Eczema (*Nar-Farsi haad*)
Chronic Eczema (*Nar-Farsi muzmin*)

Depending upon the type of lesion:

Acute phase	Vesiculation, Exudation, Excoriation, Erythema and Edema.
Subacute	Hyperpigmentation, scaling and crusting.
Chronic	Lichenification.

For practical purposes, eczemas are now divided into two main categories: [25,26]

1. Exogenous eczema	2. Endogenous eczema
Irritant contact eczema	Atopic eczema
Allergic contact eczema	Seborrheic eczema
Photosensitive eczema	Nummular eczema
Infective eczema	Asteatolic eczema
	Stasis eczema
	Dyshidrotic eczema

Clinical Features:

The following clinical aspects have been described in classic literature;[13,14,26]

- Variations in skin tone and colour, such as having more or less colour than normal.
- Severe itching, exudation and redness associated with the blisters on the skin.
- Lichenification, a thickening or leather-like appearance that can result from persistent irritation and itching.
- The patient's age may have an impact on the kind and location of the rash.
- Skin lesions that start on the face, scalp, hands and feet usually appear in kids under the age of two years, however they can also affect adults. In addition to bubbling, oozing, or crusting, the rash is frequently irritating.
- The rash is more frequently found on the inside of the elbow and knees in older children and adults, also the hands, feet and neck may be affected.
- During a severe epidemic, rashes can appear anywhere on the body.
- Severe itching is frequently experienced. It is possible for itching to begin prior to the rash developing. Atopic dermatitis is sometimes referred to as the "itch that rashes" because itching initially occurs, and then scratching

In brief, clinical characteristics vary according to eczema stages as well.[18]

Acute Eczema	Chronic Eczema
Erythematous	Diminished exudation
Edematous plaque	Significant scaling
Exudates also have a crusty, scaly appearance	Lichenification
	Cracking in flexural lesions

Investigations:

The above-mentioned clinical features as well as the current Hannifin and Rajka's measurement criteria are used to analysed atopic dermatitis. [27,28,29]

Examinations IgE level in serum:

Measuring the IgE level is highly beneficial, especially when the normal eczema presentation is absent, pattern of dermatitis is abnormal and no other atopic diseases are associated. It provides support for concepts on particular environmental allergens, such as dirt, meals and horse dust pathogen. The intensity increases in accordance with the severity of disease as demonstrated by the severity of the sickness. [30,31]

1. Patch Tests:

Due to atopy, each allergen has a unique antigen and this test gives exact data about the antigen. This technique involves applying an allergen to the patient's back over occlusive bandage and leaving it for at least 48 hours. During this stage,

the patient is examined for signs of hypersensitivity (inflammation, swelling or papulovesicles). A doctor with specialized training conducts this test. When evaluating chronic dermatitis, patch testing is frequently helpful. [32,33,31,30]

2. **Prick Tests:**
   The purpose of these tests is to assist the diagnosis of atopic dermatitis by detecting type 1 hypersensitivity.[25]

3. **Serological tests:** To determine the IgE and antibody levels in the blood.

4. Bacterial and viral swabs for Microscopy and Culture

5. Skin scrapings for Mycology

6. Skin biopsy (rare)

Differential Diagnosis:[9,33]

(A)

Psoriasis	**Eczema**
Moderately itchy	Very itchy
Scratching promote bleeding	It promotes oozing
Plaques well defined	Plaques not so well defined
Silvery scales	May be scale and crust
Auspitz sign positive	Auspitz sign neative

(B)

Scabies in infants	**Infantile Eczema**
Burrows present	Absent
Special pattern of lesions on palms	It spares palms, soles & genitalia
Typical lesions in family members	May be atopic diathesis in family

(C)

Dermatophytic infections	**Eczema**
Annular lesions (centre clear).	Discoid lesions
Minimal exudation/crusting	Exudation, crusting and lichenification
Potassium hydroxide mount for fungal hyphae shows fungal hyphae	Negative

Diagnosis:

- The following characteristics are used to diagnose eczema.
  - ➢ The appearance of the skin.
  - ➢ Healthy personal and familial histories of the patients.
  - ➢ Signs and symptoms and skin testing for allergies, skin rashes that appear only on particular body parts resulting from exposure to a particular chemical may be beneficial in the diagnosing process.

- Plaques with itchy exudatives and papulovesicles on the edges.
- In untreated lesions, lichenification might be noticeable.
- Skin biopsy (for the purpose of identifying malignancy)

Complications:

Dermatological complications	**Psychological complications**
Viruses, fungus or bacteria-related skin infections.	Depressive disorder
Long-lasting scars	Being anxious
Contact dermatitis	Lack of ability
Erythroderma	Economic and social problems

Management of eczema in Unani medicine

Principles of Treatment [13,34]

- *Izala-e-Sabab* (Treat the reason)
- *Tanqiya-e-Muwad* (for evacuation of bad elements)
- *Musaffiyat-e-Dam* (Blood purifier)
- *Mana-e-Ufoonat-e-Jild* (Antiinfective)
- *Musakkinat-e-Jild* (Sedative to the skin)
- *Mulayyanat wa Mushilaat* if there should be an occurrence of constipation

Treatment of Eczema:[34,14,13]

Izala-e-Sabab **(Removal of causes)**	***Tanqiya-e-Muwad*** **(For the removal of undesirable components)**
Eliminate the root cause of Eczema	*Joshanda of Sana makki* 5 grams, *Saqmooniya* 5 grams, *Haleela Kabbli* 5 grams, and *Aaloo Bukhara* 5 grams just before taking *Musaffiyat-e-Dam* (blood cleanser)

Musaffiyat-e-Dam **(Blood purifier) and** ***Mana-e-Ufoonat-e-Jild*** **(Anti-infective)**

Single drugs **(Mufradat)**	***Compound drugs*** **(Murakkabat)**
Gul-e-mundi (*Sphaeranthus Indicus* Linn.)	*Habb-e-Musaffi Khoon*
Sarphoka (*Tephrosia purpurea* Linn.)	*Majoon Ushba*
Unnab (*Ziziphus jujuba* Mill.)	*Safoof-e-Ushba*
Shahtra (*Fumaria indica* Pugsley)	*Sharbat Murakkab Musaffi khoon*
Chiraita (*Swertia chirayita* Roxb.)	*Itrifal Shahtra*
	Sharbat Unnab
	Sharbat Nilofer
	Arq-e-Shahatra
	Arq-e-Mundi

***Musakkinat-E-Jild* (Dermatological Sedative) and *Mana-E- Ufoonat-E-Jild* (Antiseptic):**
Henna (25 grams) and black cumin (25 grams) leaves should be dried and crushed before being blended with 200 millilitres of olive oil and heated until burned or charred. The mixture has to be divided, the filtrate placed in a plastic container, and the affected area applied four times a day.[17]

For relaxation use *Marham Safeda Kafoori*.

Apply *Sandal*, Murdarsang, and Kafoor after combining in Arq-e-Gulab.

Management in Allopathic Medicine: [9,26,35]

Remove the triggers:
Factors that aggravate the rash or skin, such as allergies or irritants, should be avoided. Wool and lanolin, alcohol, fragrances, dyes, and other substances are examples of irritants.

Hydration:
Apply creams, lotions, or ointments (like petroleum jelly) on the skin 2-3 times a day to keep it moisturized.

Acute localized lesions:
Soaks are used, then corticosteroids are applied topically.

Infected lesions:
Topical or systemic corticosteroids and antibiotics are used in this situation.

When treating eczema, other therapies that may be employed include:
Oral antihistamine medications are used for reducing extremely itchy skin.

If there is an infection on the skin, antibiotic creams or tablets might be used.

A medical procedure called phototherapy involves carefully exposing your skin to ultraviolet (UV) light.

CONCLUSION:
Eczema is an inflammatory reaction to the skin; it is not a fatal illness. The condition known as "*Nar-Farsi* " was widely documented by ancient Unani physicians who had extensive knowledge in the etiology, types, pathophysiology, sign and symptoms. In the treatment of eczema, they have used several single, compound and locally appropriate medications. However, particular herbal medication requires scientific support for treating eczema.

CONFLICT OF INTEREST
None declared

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AYNUL HIRRA (CAT'S EYE): INTRODUCTION AND THERAPEUTIC BENEFITS OF A PRECIOUS GEMSTONE IN THE PERSPECTIVE OF UNANI MEDICINE

Mohd. Afsahul Kalam*[1], Bisma Ashraf[2], Snober Khan[2], Ajaz Bhat[2], Ansar Ahmad[3] and Uzma Jan[2]

[1]Research Officer Unani, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, 19006, J&K
[2]PG Scholar Department of Ilmul Advia (M.D), Regional Research Institute of Unani Medicine, Kashmir University, Srinagar-190006 J&K- India
[3]Professor, Department of Ilmul Advia, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, 19006, J&K

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ABSTRACT

In the Unani System of Medicine (USM), drugs are mainly obtained from three sources: plants, animals and minerals. Drugs from mineral sources are focused less in comparison to plant-origin drugs. '*Aynul Hirra*' (cat's eye) is a precious gemstone, known for its specific glistening or shiny nature. Besides its ornamental uses, it is also used for Medicinal purposes in the form of paste and powder as mentioned by several Unani physicians. It acts as an exhilarant, nerve tonic, eye tonic, cicatrizant, antiflatulent and digestive. This comprehensive study deals with vernacular names, identification, historical significance, medicinal properties and chemical constituents of the cat's eye. This review provides us with better information about various features of a cat's eye.

No. of Pages: 7 **References: 29**

Keywords: Antiflatulent, Cat's eye, Digestive, Exhilarant, Eye tonic, Gemstone, *Lahsuniya*, Nerve tonic, Unani medicine.

INTRODUCTION:

In the Unani System of Medicine (USM), the therapeutic arsenal comprises substances derived from three primary sources: plants, animals, and minerals. While plant-based remedies are predominant, minerals are also recognized for their medicinal properties. various stones, gems and minerals are used for medicinal purposes like, *Hajrul Yahud*[1] *Marwarid*[2], *Marjan*[3], Zumurrud[4], *Lajward*[5], *Pukhraj*[6,1,2,3,4,5,6] etc. One such intriguing gemstone with both ornamental and medicinal value is '*Aynul hirra*,' commonly known as cat's eye. It is a precious gemstone renowned for its distinctive glistening or shiny appearance. Beyond its aesthetic appeal, it has found a place in traditional medicine, particularly in the Unani system. Various other types of this gemstone exist, displaying white and sometimes coloured streaks. Its shimmer often manifests as a red hue

*Corresponding author: *afsahnium@gmail.com*

with sparkling streaks, and occasionally it appears in white, gaining popularity in Western countries[7,8,9]. This aesthetically pleasing gemstone, formed from volcanic rocks, is renowned for its brilliant appearance in sunlight. It is found in America, India (Andhra Pradesh), Tanzania, Sri Lanka, and Brazil, it gained popularity in the 19th century, particularly among Jewish and Israeli communities. Prince Arthur of Duke Reign's engagement ring contributed to its fame. Its unique characteristics, including sparkling in the light like a cat's eye, intensified shine when rubbed against cloth, and a naturally milky appearance, make it identifiable. Greek philosophers noted its fiery shine when exposed to sunlight in a clay vessel. It is reminiscent of Sapphire, as mentioned in the book *Tohfa Alam Shahi*.[8] Various Greek (Unani) physicians have documented the use of the cat's eye in medicinal formulations highlighting its diverse therapeutic applications in powder and paste forms. Jewellers are particularly drawn to Chrysoberyl due to its luminous appearance. Its shiny characteristics make it a captivating choice for crafting exquisite jewellery, adding a touch of mystique and elegance to the gemstone market. This review aims to provide a comprehensive understanding of the cat's eye, covering several aspects such as vernacular names, identification, historical significance, medicinal properties, and chemical constituents. By delving into these facets, we gain valuable insights into the multifaceted nature of the cat's eye and its role in the Unani System of Medicine[9]

Mutaradifat (vernacular names):

Arabic : *'Aynul hirra*[8]
English : Cat's eye[8] , chrysoberyl [9]
Hindi : Lahsuniyah[7,8,10,], Vidurya, Ded Dari[10]
Persian : Gurba Chashm, Lahsuniya[9]
Punjabi : Lahsuniyah[8]

Chrysoberyl, known by its English name, is a captivating gemstone that derives its from the Greek words "Chrysos" and "beryllos" signifying 'precious white metal.' The gem earned the moniker "Cat's Eye" owing to its distinctive shiny appearance reminiscent of a feline's eye. In Arabic, it is referred to as '*Aynul hirr*a, where 'Ayn" translates to eye and '*Hirra*' to cat. Additionally, its resemblance to a garlic bulb has led to its alternative name, "Lahsuniya." According to Najmul Ghani, this gem is not found in Greek medicine under the name Lahsuniya but is mentioned as "Jawza". Lahsuniya is identified as one type of "Jawza," and another variant is recognized as Sang-i-Sulemani.[7,8]

Shanakht, Mahiyat wa Husul (Identification, Nature, and Acquisition):

Cat's eye, obtained from minerals like ruby or agate is considered blessed by Hindus. Described as crystalline and lustrous, it has a streak, or line resembling a cat's eye, hence named '*Aynul hirr*a. It comes in various colours, each with a pink or yellow hue, categorized into different types. In Persian, the round stone with different upper and lower layer colours is Lahsuniya; red and black are Sang-i-Sulemani, and green or yellow is '*Aynul hirra*, representing four colours: yellow, brown, green, and black[7,9]

Indian jewellers describe the following types of cat's eye:

1. *Kank Khait* : like cat's eye[8]
2. *Dum Khait* : Milky white colour[8]
3. *Sham Khait* : Black colour[8]
4. *Ghee Khait* : Ghee colour[8]
5. *Kalkatta Khait* : It is extracted from ores found near Kolkata[8]

6. *Hadia* : without streak[8]

Persian people described its three types[8]

Lahsuniya: That round stone which has different colours on the upper and lower sides.[9]

Sulemani: Reddish or Blackish.[8]

Aynul hirra: Green or Yellowish.[8]

***Mizaj* (Temperament)**: This stone has a hot and dry temperament in the 3rd Degree[7]

***Za'iqa* (Taste)**: Hakim Azam Khan mentioned its taste as Tursh (citrus)[10]

***Miqdar* (Dosage)**: usually it is used locally, sometimes used internally in the quantity of 15-60 mg[9]

***Musleh* (Corrective)**: The corrective of its adverse effect is the root extract of Babchi (*Psoralia corylifolia*)[10]

***Nisbat-i-Sitara* (Associated Star)**

Aynul hirra is associated with the Sirius star and the planet Venus.[8]

Af'al (Actions)

Muqawwi-i-Qalb (cardiac tonic), *Muhallil* (anti-inflammatory), *Mujaffif* (cicatrizant), *Jali* (detergent), *Muqawwi-i-Mi'da* (stomachic), *Muqawwi-i-Dimagh* (brain tonic)[7]

***Iste'malat* (uses):**

It is good for the heart, it safeguards against phlegmatic ailments, dispels diphtheria, eases colitis, induces extreme dryness, acts as a detergent, and is beneficial for jaundice, alleviating stomach diseases, flatulence, aids in digestion, strengthens intellect and power[7,9,]

***Tarkib-i-Iste'mal* (method of administration):**

It is used in the form of Safuf (powder), Dimad (paste) and other formulations[7,9]

S. No.	System	Indications
1.	***Amrad-i-A'sab*** (Diseases of the nerves)	It is used in nerve weakness. It alleviates twitching and convulsions and reduces spasms. It is beneficial in paralysis and severe tremors.[9]
2.	***Amrad-i-Chashm*** (Eye diseases)	Its paste helps in treating all kinds of eye diseases, especially benefiting cataracts.[9]
3.	***Amrad-i-Dandan*** (Dental diseases)	Its powder is used for strengthening the teeth.[7,9]
4.	***Iltihab, Juruḥ, Quruḥ*** (Inflammation, injuries and wounds)	Its paste helps in wound healing.[9]

Recent scientific research on the Cat's eye:

This stone comprises two components Silica and Oxygen. In compound form iron and chromium are found in less quantity. Its chemical formula is BeAl2O4. On the Mohs scale, its hardness is 8 and it is difficult to scratch, due to its hardness. It is unaffected by acids. The Refractive Index is 1.54 and the Specific gravity is 2.6 [8,9]

CONCLUSION

Among the minerals, '*Aynul hirra*, commonly known as cat's eye, stands out for its ornamental allure and medicinal significance. This gemstone's aesthetic beauty and medicinal properties have been acknowledged for centuries. In the USM cat's eye finds applications in medicinal formulations, with its powder and paste forms offering diverse therapeutic benefits.

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EFFICACY OF A TOPICAL DIMAD IN THE MANAGEMENT OF *WAJA'AL-RAKBA* (KNEE OSTEOARTHRITIS): A CASE REPORT

Adnan Ali[1], Mohammed Sheeraz Mushtaque Ahmed[2]*, Muskan Iqbal[3], and Nairah Mansoor[3]

[1]PG Scholar (M.D), Department of Moalajāt, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, Jammu and Kashmir, India.
[2]*Research Officer Level II & Reader, Department of Moalajāt, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, Jammu and Kashmir, India.
[3]UG Scholar, Institute of Asian Medical Science, Zakura, Srinagar, Jammu and Kashmir, India

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ABSTRACT

Background- Osteoarthritis is a global condition causing abnormal joint biomechanics and delayed articular cartilage deterioration, affecting the knee and affecting approximately 250 million individuals. It is a leading cause of impairment in the aged due to diabetes. Traditional treatments include pain medication, exercise, heat and cold therapy, corticosteroid injections, and joint repair or replacement surgery. The Unani medical system offers three treatment methods. '*Ilaj bi'l Tadbir* (Regimenal Therapy), '*Ilaj bi'l Taghdhiya* (Dietotherapy), '*Ilaj bi'l Dawa* (Pharmacotherapy), and 'Ilaj bi'l Yad (Surgery), each with its own restrictions.

Objectives- Efficacy of a topical *Dimad* in the management of *Waja-al-Rakba* (knee Osteoarthritis) and provide safe, effective and feasibly available with no or minimum side effect.

Methods- A 40-year old female with bilateral knee pain and stiffness, diagnosed six months ago, presented to the OPD of the *Regional Research Institute of Unani Medicine, Srinagar.* Despite receiving analgesics, anti-inflammatory drugs, and physical therapy, she continued to deteriorate. In this study, a *Dimad* or medicated paste is applied over the anterior part of the left knee for two weeks daily twice a day for at least 15-20 minutes and then washed-out area with lukewarm water.

Result- The study found that topical *Dimad* formulation effectively treated knee joint symptoms and inflammation. The patient's VAS scores decreased from 9 to 1 by the 14th day, indicating a decrease in symptoms. The treatment was safe and bearable, and the patient's quality of life improved significantly. After treatment, there was a statistically significant decrease in mean VAS ratings from day 0 to day 14.

Conclusion- The patient reported a significant improvement in pain, stiffness, and soreness, and a significant decrease in mean VAS ratings from day 0 to day 14 after treatment.

No. of Pages: 7 **References: 14**

Keywords: Dimad, Waja'al-Rakba, Knee Osteoarthritis, Case Report, Unani management, VAS.

*Corresponding author: *drsheerazmd@gmail.com*

INTRODUCTION

Osteoarthritis is a condition that causes abnormal joint biomechanics and delayed deterioration of articular cartilage. The pathogenic changes are biochemically induced. Knee osteoarthritis is a common and debilitating cause of joint degeneration.[1]Knee osteoarthritis affects both the patella-femoral and medial Tibio-femoral compartments of the knee.[2] Approximately 250 million individuals are impacted globally.[3] In India, OA affects 22% to 39% of the population, making it the second most prevalent rheumatologic condition.[4] Diabetes is a leading cause of impairment in the aged, owing to its high prevalence and accompanying disability rates.[5] The condition is distinguished by joint pain, soreness, restricted mobility, crepitus, intermittent effusion, and various degrees of local inflammation.[6] Pain medication NSAID and cox-2 inhibitors), exercise, heat and cold therapy, corticosteroid injections,and joint repair or replacement surgery are among the traditional treatments for osteoarthritis . Even with therapy, osteoarthritis can progress, resulting in ongoing discomfort and dysfunction.[7] There are now several osteoarthritis treatment options available, each with its own set of restrictions. Unfortunately, there is no cost-effective, side-effect-free medicine for OA that may alleviate symptoms and cure the disease. The aim for economical, effective, and less dangerous drugs needs scientific confirmation of established treatments.[8,9] This sickness is not precisely explained in the Unani medical system. *Waja'al-Mafāsil* refers to all types of arthritis.[10] Ancient Unani physicians classified arthritis according to temperament, the presence or absence of harmful material, the type of harmful material, and the location of symptoms, giving specific names to conditions such as *Niqris* (gout), *Waja'al-Warik* (hip joint pain), *Irq'al-Nasa* (sciatica), and *Waja'al-Unuq* (neck pain).[11] Similarly, "*Waja'al-Rukba*" refers to knee pain, with"*Waja*" meaning pain and"*Rukba*" meaning knee. Knee osteoarthritis is treated using the *Waja'al-Mafāsil* instructions from Unani literature. Unani medicine offers three treatment methods: '*Ilāj bi'l Tadbīr* (Regimenal Therapy) and '*Ilāj bi'l Taghdhiya* (Dietotherapy), '*Ilāj bi'l Dawā* (Pharmacotherapy), and '*Ilāj bi'l Yad* (Surgery). *Ilāj bi'l Tadbīr* offers non-pharmacological or minimally drug-based therapy. Ancient medics employed *Dimād* or medicated Paste on the skin to address numerous painful musculoskeletal ailments.[12]In this context, A *Dimād;* which is a pharmacopeial Unani preparation was applied over the anterior part of the left knee for two weeks daily twice a day for atleast 15-20 min.

MATERIALS AND METHODS

Case report

A 40 year old k/c/o Hypertension non-diabetic female patient presented to the OPD of Regional Research Institute of Unani Medicine, Srinagarwith symptoms of bilateral knee pain and stiffness that date back six months. After receiving care from his family doctor, who recommended analgesics and anti-inflammatory drugs along with physical therapy, she continued to deteriorate. She complained of pain and limited mobility that got worse after standing and walking for more than half an hour. Restricting the movement helped to ease the discomfort. The patient has no additional history of knee trauma or damage, and there is no family history of knee pain complaints.

Therapeutic intervention

The *Dimād* was prepared in the *Saidla* lab of ***Regional Research Institute of Unani Medicine, Srinagar*** as per the guidelines of the National Formulary of Unani Medicine. The ingredients of given in table.1 and the application of *Dimād* procedure was explained to the patient in detailed before the treatment and written consent was obtained from the patient by the researcher. The *Dimād* was given to the patient in the form of paste and the patient was explained to apply the paste on affected knee joint and cover the sufficient area with paste for 15-20 minutes twice a day and then the area was washed-out properly with lukewarm water.

Ingredients of the *Dimād*[11,12,13]

Table: 1

Sl. No.	Unani name	Botanical name/ Scienctific name	Action
1.	Barg-e-chinar	*Platanus orientalis*	Antiinflammatory
2.	Namak Ta'am	(*Sodium chloride*)	Neuralgic/Rheumatic pain
3.	Turmeric	(Curcuma longa)	Antiinflammatory

Diagnostic assessment

Before starting the procedure, patient underwent through some precautionary physical and musculoskeletal examination. Following results were observed:-

- The onset of pain was gradual and started approximately 2 months back.
- The nature of pain was dull, aching and was felt more on medial side of knees with severity 6/10 on most days ,increasing to 8/10 after prolonged activity.
- The symptoms associated were occasional swelling, stiffness lasting 20 to 30 minutes in morning and crepitus felt during flexion and extension.
- Patient appears moderately overweight, walking with a slight antalgic gait (limp to avoid pain).
- Upon palpation, tenderness was found over the medial joint line with no significant warmth around the joint.
- The range of motion was decreased with flexion: 100° (normal :135°) and extension: -10°(normal :0°)

Follow up and outcome measures

The treatment was given daily twice a day up-to 14 days, follow up on every week for two weeks; and findings and outcomes were monitored and patient was then assessed on days 0, 7th and 14thday of the treatment with the help of objective parameters i.e, Visual Analogue Scale (VAS) for measurement of pain and active range of motion scores (Observing intensity of joint stiffness during the daily life activities) and WOMAC scale. The total VAS was 9 (pain is very severe at this score) at baseline which improved to 5 on the 7th day and 1 on the 14th day, pointing to reduction in the severity of symptoms. Also, during the treatment, no adverse effects were noticed. also Treatment was safe and tolerable for the patient.

WOMAC Scale

The WOMAC questionnaire has three sub-scales: pain (five questions), stiffness (two questions), and physical function (17 questions). The sub-scale ratings range from 0 to 20 for pain, 0 to 8 for stiffness, and 0 to 68 for physical function. The overall WOMAC score is calculated by adding the items from all three sub-scales. (0-96). Higher WOMAC ratings imply more discomfort, stiffness, and functional limits. Table 2: Showing WOMAC Scores at Baseline 0th day, 7th day and 14th day at the treatment.

Table 2: WOMAC Scale Scores.

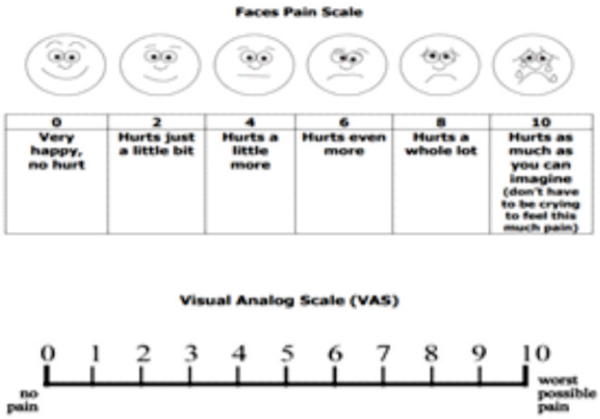
	Baseline 0thday	**7th day**	**14th day**
Rt Knee	76	48	22
Lt Knee	60	34	18

Outcomes of the case study

The patient was asked to rate his knee pain on VAS scale and WOMAC scale at the Baseline, 1 week and on 2nd week as shown below in Table 3.

Table: 3

	Baseline 0thday	**7th day**	**14th day**
VAS	9	5	1
WOMAC	76	48	22



The VAS scale is used for assessment of severity of pain, where 0 indicates no pain at all and 10 indicates extreme pain which requires immediate medical attention.[14]

Table 4: AROM in degrees.

	Baseline	1st week	2nd week
Rt Knee flexion	100°	103°	105°
Rt Knee extension	-4°	-3°	-2

Showcase of AROM scores in degree at baseline, 1ST and 2nd week.

RESULTS AND DISCUSSION

In the present case study, we found that the application of topical Dimād formulation in treating the symptoms and reduction in pain and inflammation in the knee joint is showing significant results. Follow up was done on 7th and 14th day of the study at *Regional Research Institute of Unani Medicine, Srinagar* OPD and the patient was evaluated on days 0, 7, and 14 of the treatment with the use of objective parameters, such as the Visual Analogue Scale (VAS) for measuring pain and active range of motion scores (observing the intensity of joint stiffness during the daily activities) and the WOMAC scale. The treatment was administered twice daily for 14 days, with follow-up every week for two weeks. The baseline total VAS score was 9, which indicates very severe pain. By the seventh day, it had dropped to 5, and by the fourteenth day, it had dropped to 1, indicating a decrease in the severity of symptoms. Additionally, no side effects were seen during the course of therapy. Additionally, the patient found the treatment to be both safe and bearable. Both the VAS score for pain, stiffness, and soreness as well as the quality of life significantly improved. Additionally, following treatment completion, a statistically significant decrease in mean VAS ratings from day 0 to day 14 was noted.

Declaration of patient consent

The authors attest that all required patient permission forms have been submitted to them. The patient signed these documents consenting to the journal's sharing of their clinical data. Although every attempt will be made to keep the patient's identity confidential, total anonymity cannot be ensured. The patient is aware that their names and initials will not be published.

Conclusion and Future scope

We have attempted to demonstrate the potential of *Dimād* formulation in a non diabetic patient with osteoarthritis in the knee in this case study. One of the special therapeutic modalities mentioned in the Unani medical system, the reduction of pain and inflammation, was effectively addressed. To further elucidate the efficacy of this therapy method, however, large-scale randomized controlled trials are needed.

Ethical approval

Not applicable

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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KIBRIT (SULPHUR): MEDICINAL IMPORTANCE IN PERSPECTIVE OF UNANI MEDICINE AND PHARMACOLOGICAL STUDIES

Arshi Aqeel[1], Mohd Afsahul Kalam*[2], Urzeeba Zahoor[3], Khan Sabiha Arzoo[3], Mohammad Avid[3] and Riyaz Ahmad[3]

[1]PG Scholar Department of Moalajat, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, 190006, J&K, India
[2]Research Officer Unani, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, 190006, J&K, India
[3]PG Scholar Department of Ilmul Advia, Regional Research Institute of Unani Medicine, University of Kashmir, Habak, Naseembagh Campus, Hazratbal, 190006, J&K, India

Review Paper

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ABSTRACT

Kibrit (Sulphur) is the non-metal mineral drug of Unani Medicine used for the treatment of skin disorders. It is also known as *Gandhak*. Sulphur, due to its high reactivity, readily participates in a multitude of chemical reactions, leading to the creation of compounds with a vast array of properties. Throughout history, the reactions involving Sulphur and the resulting compounds have fascinated and inspired people. Sulphur has long been linked with volcanoes, flames, and pungent odours, evoking a sense of intrigue and awe. It has anti-inflammatory, blood purifier, laxative, antiseptic, germicidal and expectorant action. It is used to treat arthritis, skin disorders, constipation, piles, cough due to above-mentioned actions. This drug has been used for a long for treating skin disorders in the Unani system of medicine. Its temperament is hot and dry.

No. of Pages: 7 **References: 15**

Keywords: Gandhak, germicidal, Kibrit, Unani medicine.

Introduction:

Unani System of Medicine (USM) is the most ancient healing heritage of the world, serving the ailing society with indigenous medicines of herbal, mineral and metallic origin. The medicines used in Unani for various diseases are time-tested concerning their efficacy and safety. Sulphur was known in ancient times. A Sulphur ointment used in ancient Egypt is evident from Ebers Papyrus. It was used for fumigation in pre-classical Greece. Java, Indonesia, Chile, Japan, Mexico, Sicily, Europe, Asia[1]. *Gandhak* or Sulphur is an element obtained from mineral source. It is one of the important elements which are necessary for all forms of life because it is also widely used in metabolic processes. The human body contains approximately 140g of Sulphur, mainly in the form of proteins. Although it is not much essential like other minerals because its deficiency doesn't cause any visible symptoms[2]. Sulphur molecules operate as fuels and respiratory components in metabolic reactions.

*Corresponding author: *afsahnium@gmail.com*

The vitamins, biotin and thiamine, the latter of which is called after the Greek word for Sulphur, both include Sulphur in organic form. The protein keratin, which is present in the outer skin, hair, and feathers, is predominantly supported by disulfide bonds, which also contribute to the element's strong odor when burned. Apart from its necessity for metabolism process, it has been also used as a potent medicine in USM for various kinds of skin manifestations of different bacterial origin. Gandhak can be used internally or tropically in different forms. Gandhak has fungicidal, bactericidal, anti-parasitic effect and mainly used in various skin diseases like dermatitis, psoriasis, eczema, internally-arthritis and chronic cough. Gandhak is used as a broad spectrum medicine for curing the skin diseases of the body parts irrespective of origin of microbes[1].

They are effective within smallest dose of 60 mg to maximum dose of 250 mg, having properties like tasteless, easily absorbed and assimilated[2]. The discovery of sulphonamide (organo-sulphur compounds) as an antibacterial drug by a German scientist, Gerhard Domgak, marks an important milestone in the development of medicinal chemistry[3]. According to Unani physician, *Gandhak* is formed after mixing of light and dry vapors from soil when naturally heated up then it becomes hot, lubricant, lightweight, in this by way Sulphur produced and due to its hot nature it catches fire suddenly when heat is provided. In European country it is mainly found in compound form along with other matters, its compounds known as sulphide e.g. lead sulphide, zinc sulphide, iron sulphide, copper sulphide, calcium sulphide etc. From these compounds Sulphur can be separated only

***Mutarādifāt* (vernacular names)**

Arabic:	Kibrīt[4,5,6],
Bengali:	Gandrak, Gandhak[7]
English:	Sulphur[6,8], Sublimed Sulphur, brimstone,
Gujrati:	Gandhak[7]
Hindi:	Gandak[7], Gandhak [6]
Kashmiri:	Gandhak[7]
Kannad:	Gandhak[7]
Malayalam:	Gendkam[7]
Marathi:	Gandhak[7]
Panjabi:	Gandhak, *Kibrīt* Anwalasar, Gogird[7]
Persian:	Gogird[5,6]
Sanskrit:	Gandhaka[7], Gandh Pashan[7]
Sinhalese:	Gandhak[7]
Tamil:	Gandkam[7]
Telugu:	Gandhakam[7]
Ayurvedic:	Gandhaka[7]

Identification, description and collection:

Sulphur is a non-metal element which is commonly known as Gandhak. It is an abundant, multivalent non-metal element, in its native form it is bright yellow crystalline solid. In nature, it can be found as the pure element and as sulfide and sulfate minerals. At room temperature, sulphur is a soft; bright-yellow solid with only a faint odor, similar to that of matches, the strong smell of Sulphur usually refers to the odour of hydrogen sulfide or organ Sulphur compounds. It occurs in the nature in the form of pure Sulphur, sulphides and sulphates[9]. In India it is of 2 types: One is called "*Gandhak Anwalāsar*" and other one is "*Gandhak Muthiya*". *Gandhak Amalāsar* looks greenish and shining, *Gandhak Muthiya* is available in the form of *Batti*/*Sahyyaf* about 2-3 inch long and one inch in diameter. This is also called "role Sulphur". Pure Sulphur is tasteless, odourless. It can't dissolve in alcohol and water but it often melts in ghee and oil when put on fire. Pure shulphur gives nothing if burnt. According to colour it classified in 5 types 1. Red Sulphur, 2. Yellow Sulphur, 3. Greenish white Sulphur 4. Bluish Sulphur, 5. Blackish sulphur. Some says that bright red, clear and heavy one is good quality and some considered yellow which is odourable and clear is of good quality. *Arastu* (Aristotle) said red Sulphur which is mention in its type has not been seen but others said its relationship with Sulphur is famous. According to Unani physicians Sulphur is found in various forms, first one is in powdered form which is formed when Sulphur's vapors received coldness then it became cold and fine crystals which is made into powder form; this type is known as

flower of Sulphur (*Gandhak ka Phūl*). Its powder is mild coarse, beautiful, greenish yellow, tasteless without odour. It burns with a blue flame and produces sulphuric acid, and converts totally into vapors form. Second is found in suppository form about 2-3 inch long and one inch in diameter. This is also called "role Sulphur". 3rd one is available in the form of crystals which is known as *Āmlasār Gandhak* (annulus of Sulphur). Sublimated Sulphur can precipitate by slaked lime, acids of salts and water. This Sulphur is known as precipitation Sulphur, milk sulphurious and milk of Sulphur. Precipitated Sulphur is mainly used in skin disease. Sulphur oil on dissolve Sulphur with yolk and made tablet form put tablets into fire proof bottle and extract oil after put the fire proof bottle over the coal.[6]

Taba'i Khusūsiyāt
(morphological characteristics)

- ***Rang*** (Colour): Before purification its colour is bright yellow, on heating it becomes Reddish brown and after purification, its colour becomes dark yellow.
- ***Bu*** (odour): Sharp and unpleasant[9]
- ***Qiwām*** (Consistency): Hard, easy to break
- ***Maza*** (taste): Before purification its taste is bitter and after purification it becomes tasteless[9].

***Tahlīl* (Dissolution) and reaction to heat**: It is not dissolved in alcohol and water but dissolved in Ghee, turpentine oil and other oils. On heating at 239 °F it melts like water and gives dull greyish colour. As the temperature increases it becomes grimy. On heating at 430-480 °F, thick and mucilaginous Sulphur is obtained which is not able to pour due to its thick consistency but when it is put in water then it becomes soft like wax but can't maintain this structure and after some time it returns to original form. On heating at 480°F. It becomes thin and at 750°F it boils and changes into red vapours. Sulphur gives fire with blue flame after heating. Sublimation sulphur can precipitate by slaked lime, Acids of salts and water[6].

Fig: Showing various forms of Gandhak (Sulphur)

***Mizaj* (temperament):** Its temperament is hot and dry in the 3rd degree but according to Ibn Sina, Hot and dry in the 4th degree[6,8].

***Af'al* (action):** Sulphur has been used as medicament since antiquity for its activities like, *Dāfi'-i-Jarab* (scabicidal), *Dāfi'-i-Huwām* (insecticidal), *Qātil-i-Jarāthīm* (germicidal), *Dāfi'-i-Qūbā* (fungicidal), *Mushil* (purgative), *Musaffi-i-Khūn* (blood purifier), *Mukhrij-i-Balgham* (expectorant), *Mujaffif* (siccative), *Dāfi'-i-Quruh* (wound healer), *Dāfi'-i-Ufūnat* (antiseptic), *Muhallil-i-Awaram*(anti-inflammatory), *Jādhib-i-Rutūbat* (absorbent), *Musakhkhin* (calorific),

Mulattif (demulcent), *Mudirr-i-Hayd* (emmenagogue), *Musqit-i-Janīn* (abortifacient), *Muqawwi-i-Bah* (aphrodisiac), *Kasir-i-Riyāh* (carminative) *Jāli* (detergent), *Mushil-i-Safra*' (cholagogue), *Mudir* (diuretics), *Mulayyin* (laxatives), *Mushil* (purgative) in large dose, *Mu'arriq* (diaphoretic), *Dāfi'-i-Humma* (antipyretics) properties[6,8,4,5].

***Iste'mālāt* (uses):** It is used to treat various diseases like *Jarab* (scabies), *Kalaf* (melasma), *Nazla* (catarrh), *Zukām* (cold), *Ribu* (asthma), *Su'āl-i-Martūb* (productive cough), *Yaraqān* (jaundice), *Ihtibas-i-Hayd* (amenorrhea), *Sara*' (epilepsy), *Shaqīqa* (migraine), *Waja*' *al-Mafāsil* (arthralgia), *Irq al-Nasa* (sciatica), *Sakta* (stroke), *Du'f-i-Bah* (sexual weakness), *Ātashak* (syphilis), *Suzak* (gonorrhea), *Juzam* (leprosy), *Amrād-i-Tihāl* (splenic diseases), *Fālij* (paralysis), *Tashannuj* (convulsion), *Sil wa Diq* (tuberculosis), *Bawāsīr* (piles)[6,8].

***Tarkīb-i-Iste'mal* (mode of administration):**

Head and brain diseases

1. According to Unani physicians Jālīnūs (Galen). He saw a man having melancholic jaundice for 5 years. When he used *Gandhak* with *Badam Talkh*, his health condition was improved[6].

Skin diseases and cosmetic uses

1. White inferior to yellow variety is preferred for external application. Red and black sublime Sulphur is also used externally as a deodorant and disinfectant fumigant[4]
2. Topical applications of Sulphur as ointments or creams might provides benefits for various skin conditions such as acne, eczema or psoriasis.[1]
3. It reduces to reduce wet pruritus by killing bacteria present on the skin which causes itching[6].
4. When applied to the wounds, it leads to profuse itching and kills microorganisms[6].
5. Mostly Sulphur is said to be effective in scabies and used in the form of compound formulation *Marham-i-Gandhak*.[6]
6. In the case of Acne vulgaris Sulphur ointment is applied on the face, and it absorbs easily without any stain on the face[6].
7. Taking a bath in natural springs having Sulphur is useful in skin disease[6].
8. The fine powder of Sulphur dissolved in Ghee is used as a face pack to cure itching, melasma, chloasma, boil, and carbuncle[6].

Diseases of the Ear, Nose, Throat

In the case of epidemic diphtheria Sulphur is said to be beneficial when used as dusting powder[6].

Lung diseases

1. In a healthy person, Sulphur provides moisture to the mucous membrane of the trachea[6].
2. Sulphur is excreted out through urine in the form of sulphates and through lungs, milk & skin in the form of sulphuric hydrogen, that's why its smell comes in breathing[6].

Gastrointestinal Diseases

2. It can't dissolve in the mouth so there is no effect in the stomach but after reaching to the intestines some parts of the Sulphur change into sulphide and hydrogen sulphide which causes abrasion to the intestines and further causes 1-2 lose motion by increasing peristaltic movement[6]
3. In the case of piles and anal fissures the use of Sulphur orally as a tablet form is effective because of its purgative and analgesic effect[6].
4. In case of mild constipation *Qurs-e-Gogard* 2 tablets are used at bed time[6].
5. Water from natural springs in which Sulphur is already present is used in liver dysfunction[6]

6. In case of prolapsed rectum the fumigation of Sulphur is used for health improvement[6].

Joint Disorders

1. Water from natural springs in which Sulphur is already present is used in arthritis, by taking a bath in this water[6].
2. In the case of arthritis and sciatica application of *Marham-i-Gogard* over the joints is useful in reducing the pain[6].
7. To reduce the thickness of viscous and sticky sputum that appears in chronic cough Sulphur is used in the form of a tablet[6].
8. For fungal infection which occurs at the time of menopausal stage of women, it is used for analgesic purposes and reduces itching.[6]
9. It reduces the factors that produce pus in the stomach and intestines and provides strength to the mucous membranes.[6]
10. In case of infectious diseases Sulphur is used as fumigating agent to detoxify the room[6].
11. The mixing of *Gandhak* with *Gumakkiya* and curd is useful in, boil, carbuncle and wet itching.
12. The use of Sulphur by mixing with honey, vinegar, *Anacylus pyrethrum* D.C., is beneficial for leprosy and melancholic diseases[6].
13. The use of Sulphur with vinegar is beneficial for Melasma and Chloasma.[6]
14. Soaked cotton in the Sulphur oil is applied to the affected teeth but excessive use of this oil causes weakness in teeth[6].
15. Sulphur oil helps to reduce pharyngeal and laryngeal infections[6].
16. Soaked cotton in the Sulphur oil is applied over the scorpion bite, it acts as an antidote[6].
17. The use of a few drops of Sulphur oil with water helps decrease the size of the spleen[6]
18. A few drops of Sulphur oil with water are taken to induce appetite.[6]
19. Clove, Cinnamon bark is soaked in distilled water of Sulphur and then dried to make powder, which is used to increase libido[6]
20. A fine powder prepared with 750 mg of Sulphur with 75 mg of Terminalia is used with lubricant Brinjal oil seed after 4 hours of light diet; it is beneficial to reduce paralysis, tuberculosis, chronic cough and piles.

***Miqdar Khurak* (dose):** ½-1 gm[5,6].

***Madarrat* (adverse effects):** Sulphur is harmful to the stomach and brain.[5,6] Excessive use can cause nerve palsy, indigestion, constipation and also decreases RBC production. Excessive use of *Ma'jun-i-Gogard* and *Ma'jun-i-Sana* causes indigestion and inflammatory bowel diseases so it always is used in the therapeutic dose and time duration which is mentioned in classic books that are 1-1.5 g[6].

***Muslih* (correctives) and *Tadbir-i-Advia* (Detoxification):**
It is detoxified by a specific method, one part of *Gandhak Amalsar* and two parts of Roghan (Ghee) are taken in a ladle and kept on low fire. When Gandhak is melted, four parts of the milk are added. This process is repeated at least three times changing the fresh Ghee and Milk each time to obtain *Gandhak Mudabbar*[1,5,6].

The metal is melted in equal quantities of Ghee (clarified butter) in a stainless steel pot and cooked on mild fire. Another stainless steel pot is filled up to 2/3 of its capacity with cow's milk. Melted Sulphur is poured into the second pot through a clean cloth. Sulphur gets solidified in milk. It is removed from milk, washed with warm water and dried. The process should be repeated three times[4].

***Badal* (substitute):** *Haṛtāl* (Orpiment)[4]

***Murakkabat* (compound formulation)**: *Marham Ushaq, Habb-i-Quba, Dawa-i-Siyāh Mushil, Ḍimād-i-Jarb, Dimad-i-Niqris, Dimad-i-Ātashak, Roghan-i-Gandhak, Habb-i-Kibrīt, Marham-i-Kibrīt, Safūf-i-Māmīrān*.

Table 01: Compound formulations having Gandhak as one of the important ingredients mentioned with mode of administration and uses.

S. No.	Compound formulation	Mode of Administration	Uses
1.	Marham-i-Ushaq	Locally	It is useful in Peritonsillar abscess (Quincy), Benign hypertrophy, and is used as a pain killer[9,11]
2.	Ḥabb-i-Qūba	Locally with lemon juice	Ringworms[4,9,11]
3.	Ḥabb-i-Kibrīt	1-4 pieces Orally	As a carminative use in Indigestion, piles[11]
4.	Ḥabb-i-Siyāh	Locally	Conjunctivitis[4,9]
5.	Dawā-i-Siyāh Mushil	Orally, locally	Syphilis[11], Leprosy, Syphilis, Arthritis9
6.	Dawā-i-Kibrīt	3-5g Orally	Loss of libido, paralysis, tremors, facial palsy[9]
7.	Ḍimād-i-Jarb	Locally	Pruritus, Rashes, Scabies[9,11.]
8.	Ḍimād-i-Ushaq	Locally	Inflammation[9]
9.	Ḍimād Kibrīt	Locally	Splenomegaly[9,11]
10.	Roghan-i-Gandhak	Locally	Arthritis especially heel bone pain[6]
11	Marham-i-Ushaq	Locally	Splenomegaly, Inflammation, scrofula[6]
12.	Safūf-i-Gandhak	Locally	Skin diseases[6]
13.	Gandhak Ṭilā	Locally	Skin diseases like eczema, dermatitis[11].
14.	Marham-i-Khārish Jadīd	As a local (paste)	Itchy rashes, healing[11]
15.	Kushta Tila Marwaridi	30mg orally with *Dawa al-Misk Mu'tadil*	Tuberculosis[9,11]
16.	Kushta Fawlad	Orally 60 mg with *Jawarish Jalinus*	Anaemia, generalized weakness, loss of libido[11,]
17.	Kuhsta Mirgang	Orally 60 mg with Jawarish Jalinus	Liver and stomach ailments because of restorative effects Haemorrhagic disorder[11]
18.	Ma'jun Murawwah al-Arwah	5g orally	Brain tonic, cardiac tonic, hepatic tonic[9].

Sulphur toxicity

Sulphur generally has low toxicity for humans, but excessive ingestion can lead to diarrhea or a burning sensation in the gastrointestinal tract. Inhaling sulfur dust can irritate the airways and cause coughing. It may also cause skin and eye irritation, and in some cases, blurred vision14.

Pharmacological Studies:

Antimicrobial Activity

Sulphur has an antimicrobial activity. It exhibits strong anti-bacterial activity mostly against E.coli (gram-negative bacteria) and staphylococcus aureus rod shaped monoclinic, Sulphur nanoparticles inhibited growth of staphylococcus aureus while as the micro-sized particles of sulphur has shown no anti-microbial activity Sulphur has been recognized for its antimicrobial properties for centuries, often used in traditional medicine and as a preservative. Its antimicrobial activity primarily arises from its ability to interfere with the metabolic processes of bacteria, fungi, and other microorganisms. Here's a detailed look into the antimicrobial activity of Sulphur (Table 2):

Table 2: Mechanism of action of Sulphur on microorganisms.

S. No.		
A.	**Mechanism of Action:**	
1.	Disruption of Microbial Metabolism	By inhibiting the activity of certain enzymes and can prevent the synthesis of essential cellular components like proteins, nucleic acids, and cell walls.
2.	Production of Reactive Sulfur Species (RSS)	It can damage cellular components, leading to the death of the microorganism.
3.	Disruption of Membrane Integrity	Some sulfur compounds can integrate into microbial cell membranes, disrupting their integrity and leading to cell lysis.
B.	**Types of Sulfur Compounds with Antimicrobial Activity**	
1.	Elemental Sulphur	Often used in topical preparations, elemental sulfur can treat various skin infections, including those caused by fungi and bacteria
2.	Sulfur Dioxide (SO_2)	Organic sulfur compounds containing the -SH group, such as allicin from garlic, exhibit potent antimicrobial effects, particularly against bacteria.
3.	Thiols and Thioesters	Organic sulfur compounds containing the -SH group, such as allicin from garlic, exhibit potent antimicrobial effects, particularly against bacteria.
4.	**Spectrum of Activity:**	
1.	Antibacterial Activity	Sulphur and its compounds are effective against a range of bacteria, including Gram-positive and Gram-negative species. They are particularly active against acne-causing bacteria like *Propionibacterium acnes.*

2.	Antifungal Activity	Sulphur has been shown to be effective against several types of fungi, including those causing superficial and systemic infections.
3.	Antiparasitic Activity	Sulphur has been used to treat parasitic infections like scabies and other mite-related skin conditions.
D.	**Spectrum of Activity**	
1.	Antifungal Activity	Sulphur has been shown to be effective against several types of fungi, including those causing superficial and systemic infections.
2.	Antifungal Activity	Sulphur is effective against several types of fungi, including those causing superficial and systemic infections.
3.	Antiparasitic Activity	Sulfur has been used to treat parasitic infections like scabies and other mite-related skin conditions
E.	**Challenges and Considerations**	
1.	Resistance Development	While Sulphur is generally effective, there is always a concern about the development of microbial resistance, particularly with prolonged use.
2.	Toxicity and Irritation	High concentrations of Sulphur, especially in topical applications, can cause skin irritation or toxicity. Proper dosing and formulation are essential to minimize side effects
3.	Environmental Impact	The use of Sulphur compounds, particularly in agriculture, can have environmental repercussions, such as soil acidification or harm to non-target organisms[15]

Conclusion:

Kibrit, or sulphur, has a long medicinal history, especially for treating skin disorders. Historically, sulphur has been used topically to manage conditions like acne, eczema, and psoriasis due to its antimicrobial and keratolytic properties, which help reduce inflammation and promote dead skin cell shedding. Ancient physicians such as Dioscorides and Galen also recommended sulphur for respiratory issues, using it both through inhalation and orally for its expectorant, anti-inflammatory, and antiseptic effects. Inhalation of sulphur fumes was believed to clear respiratory passages and alleviate symptoms of colds and cough. In earlier times, sulphur was burned for fumigation to disinfect homes and prevent disease spread by releasing sulphur dioxide, a potent disinfectant gas. Today, while sulphur's internal and fumigation uses have largely been replaced by more modern treatments, it remains significant in dermatology. Sulphur is still utilized in creams and ointments, emphasizing its enduring role in skin care.

Consent and ethical approval:

It is not applicable.

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I/We certify that all the entries in this form are correct to the best of my/our knowledge and believe and I/we promise that I/we shall abide by the rules/regulations etc. issued from time to time by the ACADEMY and shall take active interest in all the activities of the ACADEMY.

Place:..
Date:..

..
(Signature of the Applicant/s)

N.B.: In case of spouse membership, both shall have to fill up the form in Duplicate and both shall put their signature on both set of forms.

10 **FOR OFFICE USE ONLY**

1. DD. Cheque No.for Rs.Date Dra wn on..Bank Bank has been received and Money Receipt No .. .of Dt .was sent to the applicant on Dt..

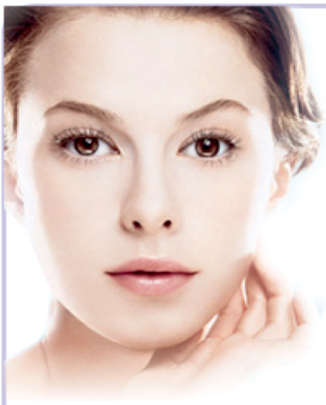
   *NEFT/Online Net Banking Transfer/*Transaction date: _____

   NEFT/Online Net Banking Transfer Transaction ID/UTR No./Payment Ref. No.:_____

   ..
   (Accountant)

2. Admitted for Life Membership and the membership number is .
3. I Card No

.
(General Secretary, NESA)



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